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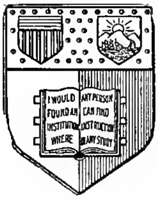
I WOULD FOUND AN INSTITUTION WHERE ANY PERSON CAN FIND INSTRUCTION IN ANY STUDY

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DAIRY NOTES.

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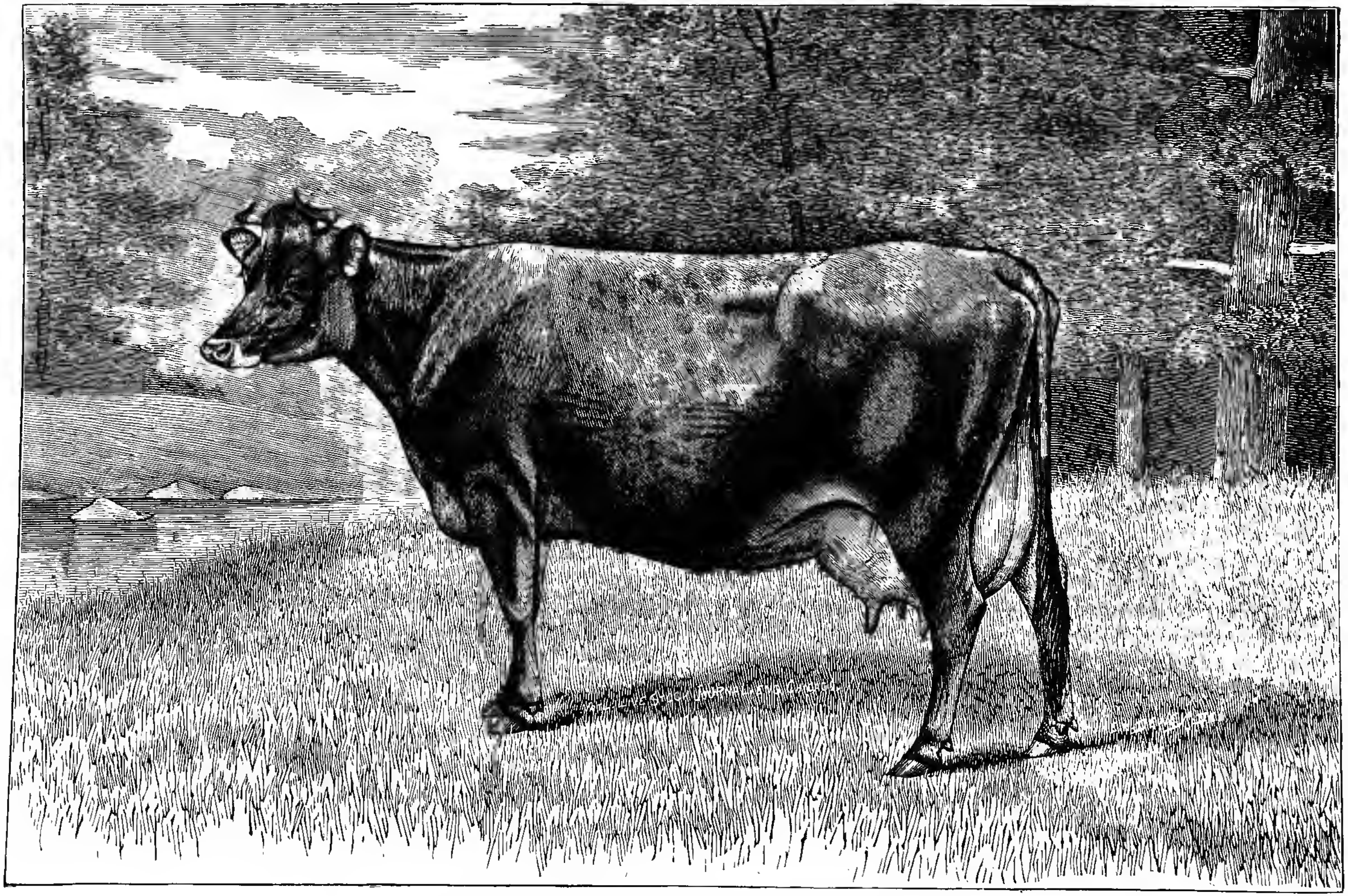

JERSEY COW, HAZEN'S BESS.

Record, 24 lbs. 11 oz. of butter in seven days, in November, 1883. Property of CHURCHMAN & JACKSON, Beech Grove, Ind.

DAIRY NOTES

A Record of the best thoughts, experiments and
observations of practical men upon
Dairy Questions.

COMPILED AND EDITED BY

R. LESPINASSE.

"The Cow is Queen."

CHICAGO.
R. LESPINASSE, PUBLISHER.

PUBLISHERS NOTE.

Every publication has an object—either a reason or fancy for its existence.

The aim of the Compiler in this case has been to gather together in convenient and attractive form a few valuable articles on leading Dairy Topics, that its possession may help the business Dairymen in the every-day routine work of the factory or the farm. Whether he has or not succeeded in accomplishing his object remains for the reader to determine.

The text comes from some of the most renowned pens on the subjects treated, and the illustrations from the pencil of the artist Dewey, engraved at the office of the National Live Stock Journal, are true pictures of the animals represented.

The publisher hopes the attractiveness of the work in its typographical appearance, and the value of its contents will induce the dairymen and creamerymen into whose hands it may fall to treasure it up as a valuable souvenir of the great American Dairy Show of 1885. So mote it be.

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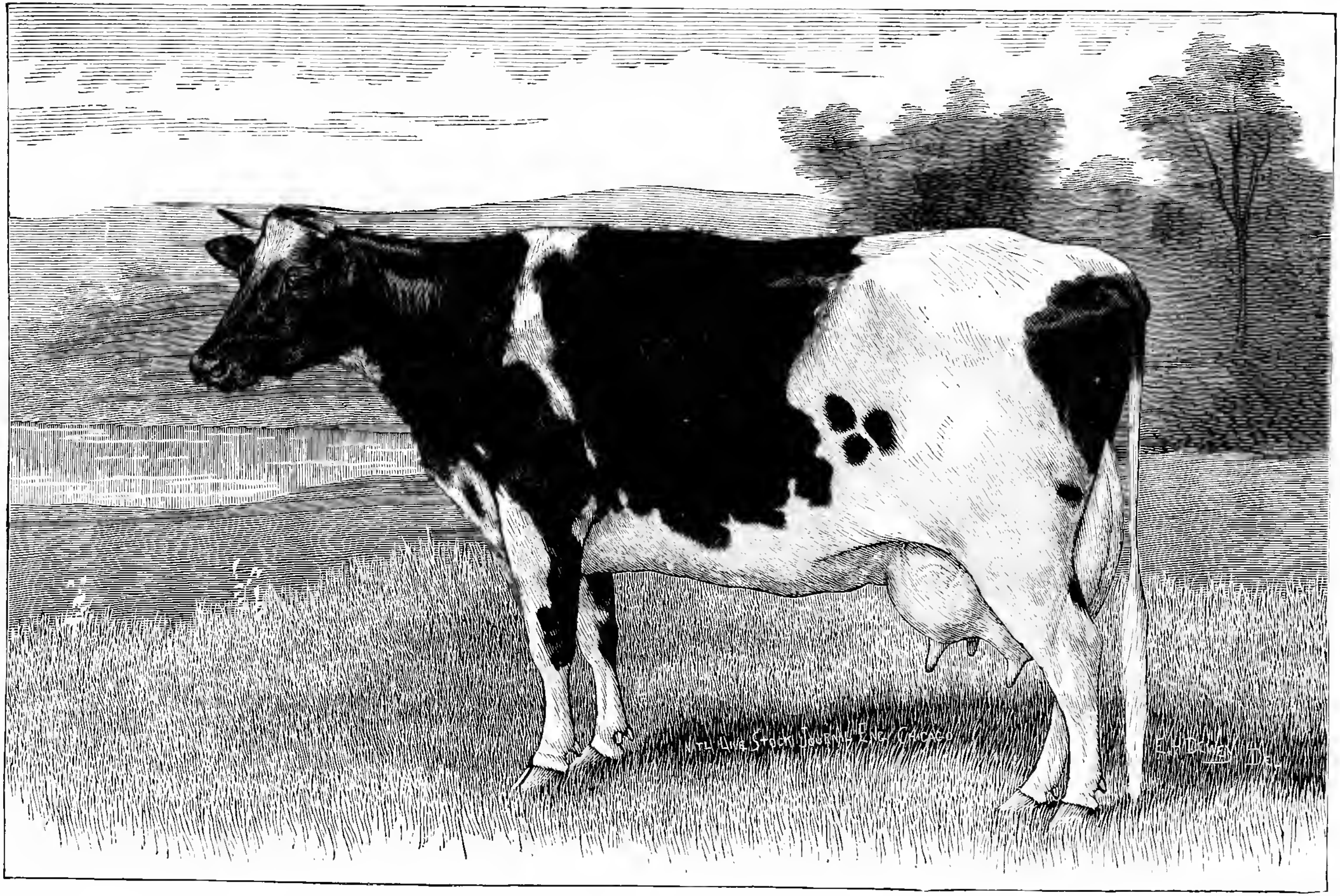
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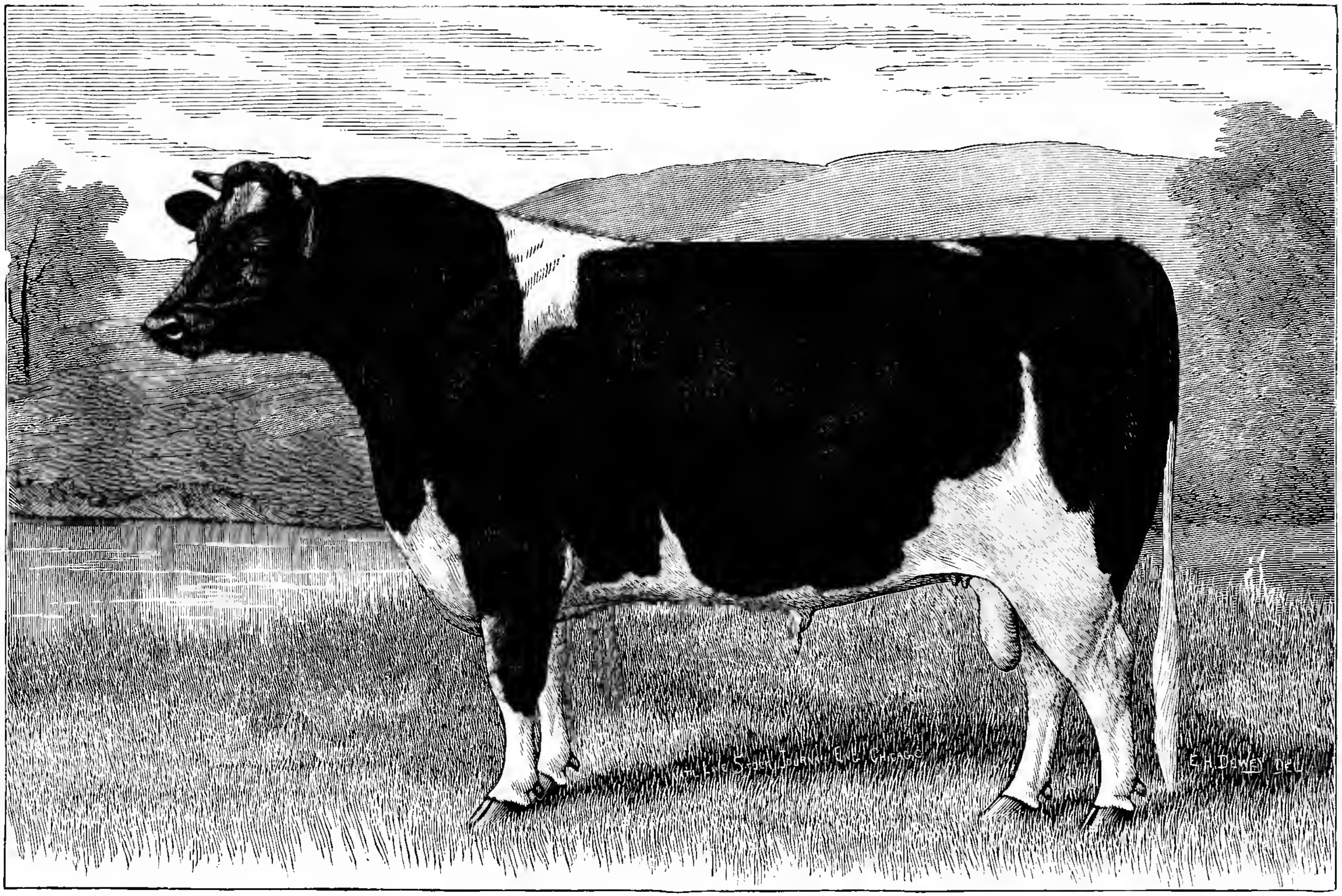
E. H. DEWEY DEL.

IMPORTED HOLSTEIN-FRIESIAN COW, DE VRIES.

Record, 121 lbs. 12 oz. of butter in 30 days. Property of J. W. STILLWELL & Co., Troy, Ohio.


The Live Stock Journal Eng. Chicago
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Imported Holstein-Friesian Bull, International Prince.

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MILK, CREAM AND BUTTER.

EDITED.

The attention of the scientists has not been called as particularly and closely to dairy matters as it has to other branches of industry. It is only within a short time that great scientific minds have started in the matter, and it is now recognized that the milk industry has opened up a great field for scientific investigation. Pasteur, the great French scientist, lately stated to a friend that his greatest desire would be, if he had some years to spare, to spend them in the laboratory of a dairy, working out the relation of germs to the milk and cheese industry.

COMPOSITION.

Milk is the original article, to be handled and changed into valuable products which will utilize all its parts to the best advantage, and, as a consequence, the first step is to find what is the composition of milk. On this point, as on a great many others, doctors do not always agree.

The composition of milk is affected in many ways, and the greatest variation comes from the fountainhead, the cow itself. From numerous analyses made by Dr. Voelcker, the distinguished chemist of the Royal Agricultural Society of England, he gives two samples as the greatest variation in genuine cow's milk, one containing 16.10 per cent. of dry matters, and the other 10.05 per cent of dry matters, in which two samples the butter and caseine parts, which to us are the interesting portions to consider, are as follows:—First sample: Butter, 7.62 per cent.; caseine, 3.31 per cent. Second sample: Butter, 1.99 per cent.; caseine, 2.94 per cent. The average given for the composition of cow's milk by modern scientists is:

Water	87.02
Butter	3.10
Caseine	4.55
Milk sugar	4.71
Mineral matter (ash)	0.60

The principal division of milk is in cream and skim milk. An average analysis gives 100 parts of milk equal to 16 parts of cream and 84 parts of skim milk; 100 parts of cream equal 21 parts of butter and 79 parts of buttermilk; and 100 parts of skim milk equal 7.5 parts of cheese and 92.5 parts of whey. Analysis of the component parts of cream gives the following percentages:

	Butter.	Buttermilk.
Water	12.00	91.10
Fat	86.00	0.78
Caseine	1.00	4.09
Albumen	0.12	0.30
Sugar	0.80	3.43
Ash	0.08	0.30

Cream varies in composition according to the various circumstances under which it is produced, and variable quantities of butter are produced from a given bulk of cream. A late report on experiments conducted at the Maine State College has given results which are of value to creamerymen and their patrons, as well as food for study and thought. Twenty samples of cream from different cows in the college farm herd, obtained by deep-setting in ice water, having been subjected to precisely similar conditions in ripening and churning, gave results varying widely, or extremes requiring from 74 to 136 cubic inches of cream for a pound of butter.

The variations in these experiments show that some creams required twice as much in bulk as others to produce one pound of butter; but you will notice that these experiments were conducted on cows fed absolutely under the same conditions, with the same feed, and cared for alike, and it should not be any matter of surprise when other scientific men of national reputation discover that a given quantity of two different creams may produce in one case more than three times the quantity of butter produced in the other, the conditions of temperature, churning, etc., being alike. In other words, it means and proves that some milk yielding 10 per cent. of cream may furnish more butter than some other milk giving 30 per cent. of cream. Dr. Sturtevant is authority for the assertion that there is not necessarily any connection between the cream percentages and the butter yield.

Authorities differ as to the specific gravity of cream, and it is safe to say that generally it will be found that cream is slightly lighter than pure water.

Butter is produced, according to Willard, by the coalescence of the small particles of oil, which are suspended in milk and partially separated in the cream. Chemically considered, it is a mixture of oleine and palmitin, with a trace of phosphate and other salts, and certain odoriferous fats or oils, from which it derives its flavor. Leaving aside all the great scientific names of the various kinds of fats which enter into the composition of butter, we simply say that butter consists of a mixture of several solid fats mixed with oleine and odoriferous oils. Ordinary butter contains about 16 per cent. of water and other substances not fat.

Butter fat consists of two substances, one of which melts at 50 deg. and the other at 105 deg.—the former oleine and the latter palmitin, with a little stearine. It is stated that butter made in summer contains a larger percentage of oleine than that made in winter, the proportions, according to one author, being 60 parts of oleine in summer and 37 in the winter.

Various devices are in use to determine the value of milk, every one more or less liable to erroneous calculations; some no better than guess-work, others approaching nearer a correct solution, but none that can be depended upon as absolutely correct.

SOME BREEDING PROBLEMS.

One of the hardest questions to answer concerning our various breeds of dairy cattle is, How were they originated? Most writers treat these breeds as though they originated by accident and were first discovered by some fortunate person many years ago, who happened to stray into some foreign country and, noting the breed's excellence, decided to bring a few specimens home with him. Thus we find Youatt and many others treating the Jersey as though it originated in Normandy in some mysterious manner, and some of the islanders taking a fancy to them brought them over from the mainland to the island in small boats. Another notion is that a breed has sprung into existence by a happy cross, as a Holstein bull on a Teeswater cow to produce the Shorthorn. Just when these happy occurrences took place no one seems to know, but in the absence of any other theory these will have to answer the purpose of an origin.

Our own notion always has been that breeds of distinctive characteristics that were not started in any way known to their present owners, probably originated from the necessities of their original owners. For instance, the breeders of Jersey cattle never could have had any considerable demand for a large flow of a medium quality of milk, because they had no buyers for milk, and they never seemed to learn how to make cheese. At the same time they were always in close communication with the large cities of England, where there was a constant demand for good butter. Thus they were forced to make butter for a living, provided they expected their cows to bring them a money return beyond the milk needed in their own families. When we come to apply this theory to the Holsteins the sailing is not so clear. Where this breed was to the manner born there were some pretty large towns to supply with milk, where no questions were asked as to its quality so long as it was believed to be pure, but at the same time the owners of these cows were noted cheese-makers and also sold butter in England. The methods of feeding were nearly similar with both Jerseys and Holsteins: tethered in the field and fed roots in the stable, the cattle being handled a great deal; yet how different the result. Each set of owners was painstaking, frugal and economical in its management.

In our day we have seen some radical changes made in the forms, colors and milking qualities of different breeds of cattle. A fashionable and extreme demand for solid colors and sleek forms has given these characteristics to the English Jersey. The same demand for symmetry and fat has nearly eliminated milk from the Shorthorn. An intense craze for a smooth udder has nearly robbed the Ayrshire of any teat whatever, as all can remember who saw the pictures of this breed twenty years ago.

The above instances only go to show how exceedingly plastic these animals are in our hands, and they warn us how cautious we must be in handling them. Indeed, it is only necessary to mark the rapid degeneration that may be noted in some particular herd that were of the highest excellence when first made up, but subsequently neglected. A half dozen years will serve to scatter their merits to the winds. From this we may argue that while the steady purpose of whole communities, as the dairy occupations of the Hollanders and the inhabitants of Jersey, may force them to a uniform action that will retain their herds in their present characteristics, yet when those herds get into foreign hands and come under new surroundings, is there not great danger that fashions or temporary demands may change those breeds in their new homes, giving them a temporary excellence, but undermining those traits of character that have required so many years to form. Before we turn the Holstein into a butter cow, or the Jersey into a cheese or general-purpose cow, let us consider well whether or not we are burning our bridges behind us when we pass rules and regulations that cut us off from obtaining fresh supplies of blood from the original home stock.—*American Dairyman.*

RANCID BUTTER.

According to Hagemann, the peculiar properties of rancid butter are due to the presence of free butyric acid, and other volatile fatty acids. These are set free from the glycerides of the butter by the action of the lactic acid arising from the fermentation of the small quantity of buttermilk retained by the butter. That the liberation of butyric acid itself is not due to a fermentative action was shown by the fact that all attempts to render butter rancid by adding to it the butyric ferment failed, and also by the fact that rancid butter failed to infect fresh butter. That the explanation given above is an adequate one, was shown by mixing both lactic acid and other dilute acids with butter or with pure butter-fat, the fat speedily becoming rancid in all cases. The same effect was produced on artificial butyrin. To prevent butter from becoming rancid, the buttermilk should, in the first place, be removed as thoroughly as practicable. In the second place, anything which will prevent the lactic fermentation will, of course, remove the cause of the evil. The author does not enter into a further consideration than to point out that acids (such as salicylic acid) are not applicable, since themselves are liable to act on the fat, and render it rancid.

MILK.

DR. MC EACHRAN.

Milk contains all the elements necessary to sustain animal life. A dog fed on beef alone will die, but on milk alone will thrive. All milk is not the same, however, for it differs according to the time that has elapsed after parturition. Often the milk given to a calf disagrees with it, because taken from a cow whose milk is older. That is, the milk of a cow six months after differs from the milk it gave one month after calving, and nature has suited the milk of each month to the requirements of the offspring. Milk is made up of albuminous, saccharine and oleaginous substances. Butter differs very slightly from fat, and the sugar of milk resembles closely ordinary sugar. The milk of all animals is much the same, except that of the carnivorous, which contains more acid. Milk resembles blood very much, and under the microscope both are seen to consist of serum, with a substance in the shape of minute globules floating in it. In the milk of a rich butter cow, as the Alderney, these globules are larger and more numerous than in that of others. The milk of a newly calved cow is thick and yellow, and if boiled, sets like cheese. Besides the ordinary globules, it contains rough bodies and more oily substance. It is not fit for food, and will make children or whoever takes it sick. Nature designs this milk to be given to the newly born offspring, and acts as a laxative to clean out the meconeum, and it is necessary that such milk be given to them. The milk of a cow should not be used as food for four or five days after calving. The number of globules is larger in the milk of the evening than the morning's, and the last drawn. The inorganic constituents of milk are very important, comprising the phosphates of lime, magnesia and iron, and salt. The change that ensues on rennet being added to milk is caused by the rennet turning the sugar contained in the milk into lactic acid, which coagulates the milk. The little globules of fat in the milk are encased in thin coverings of caseine. By churning, these coatings of caseine are rubbed off, when the particles of fat unite and form butter. The difference between good and bad butter consists in the completeness with which the caseine is removed. Few foods are so liable to change. If a cow be fed on oil cake, its milk becomes unfit for the table, and there are a large number of kinds of feeds which flavor milk unpleasantly. By experiment it was found that the milk of a cow fed on grass watered by sewage became sour and fetid in a short time. When the milk thickens soon after being drawn, or clots in the teat, the cow is unhealthy. When, in churning, the particles of butter do not cohere (gather), the cause is a deficiency of acid, owing to the health of the cow. A little acid, or adding cold water will rectify the trouble. Blue milk is due to an impoverished or ill-fed cow; red milk to the cow eating madder, hulls of peas and several wild plants; rotten milk to bad water, improper food, or dirty premises.

The milk of a sick cow ought never to be used as food, as it may communicate the disease under which the cow labors. Of diseases which affect cattle in this country, tuberculosis is the most dangerous, and milk from a cow affected by it will convey consumption to those who use it. Tuberculosis is most contagious.

ACCURACY IN THE DAIRY.

Fine dairying is a fine art, and accuracy is indispensable to success in it, says the *American Agriculturist*. Everything in the dairy should be measured or weighed. To begin, the feed should be measured out strictly, because if the quantity is short, the yield will fall off, and if it is in excess, there is an almost certain danger of an attack of garget, more or less severe, and this will at once affect the quality of the product, whether it be fine cheese or fine butter. Garget may occur unnoticed, from a very little cause, and the only effect may be a little ropiness in the milk, but as a little leaven goes through the whole lump, so this small quantity of ropy, diseased, acid milk vitiates the whole churning, and the butter is all wrong. The next thing to be accurately weighed is the milk. It is not for the mere knowledge of how much there is, but that a close watch can be kept on the cows, to see that they are all right. A spring scale should be hung in the stable, and as each cow is milked, the pail is weighed—with the milk—and the quantity of milk marked down on the dairy record. This record should have a column for each cow, and one line for each half day, and each milking, or *vice versa*, so that not only each cow's milk can be seen for every milking, but the footing will show the total milking. Unless this plan has been tried, one cannot realize the comfort and pleasure of it, and the security it gives. The cream too should be weighed, as it goes into the churn; if coloring is used, it should be measured accurately, or the butter will vary in color; the salt must also be weighed, to be exactly proportionate with the butter. And lastly, the temperature must be measured and regulated accurately, or all the previous work will be spoiled. All this work pays well, and the dairyman who practices these strict methods will succeed.

SHOULD DAIRYMEN RAISE OR BUY THEIR COWS?

Among the unsettled things in agriculture may be counted the question whether it is better for a dairyman to raise his own cows or to purchase them. There has long been a difference of opinion in regard to this matter, and very likely in the future some will continue to decide it in one way, and others in the opposite way, according to the information they may have concerning it. The writer has been in the habit of raising his own cows, and regards it as the surest, as well the cheapest way to supply them under all ordinary circumstances. Under some situations it may be cheaper to purchase. One of the considerations which bear in favor of raising cows is, that those raised on the farm where they are to be used are worth more than those raised off of it, when their natural qualities are equal, because a cow which has arrived at an age to be giving milk will have become so habituated to the place of her nativity that it will take a long time for her to recover from it when she is compelled to change places, as she always will reluctantly. The solicitude and uneasiness she feels will always reduce her work at the pail till she, at length, becomes so accustomed to her new quarters that she can feel easy and at home in them. The loss endured from this cause will go far toward paying for raising a cow at home. A second consideration is, that the purchaser always pays more for a cow than it has cost to raise her. Farm produce, like the productions of manufacturers, is never except in rare cases, sold for just what it has cost to produce it, and farm stock, cows included, are no exception to the rule. Whoever purchases must pay the profit which the producer can command above the cost of production. By raising the cows he needs, the dairyman will save paying that profit,

In the third place, those who raise cows for sale seldom raise as good ones as the dairyman can raise, if they have as good calves to start with, for the reason that they seldom know how, and if they do happen to know they do not feel the interest in rearing them in a way to secure their best development, as one would who expects to profit by such development, nor are they apt to select as good stock from which to derive the calves they raise as a man would who expected to reap the benefit which might be derived from a good milking ancestry. The ancestors of the calves are not much looked after, especially on the side of the sire, by those who raise cows for sale.

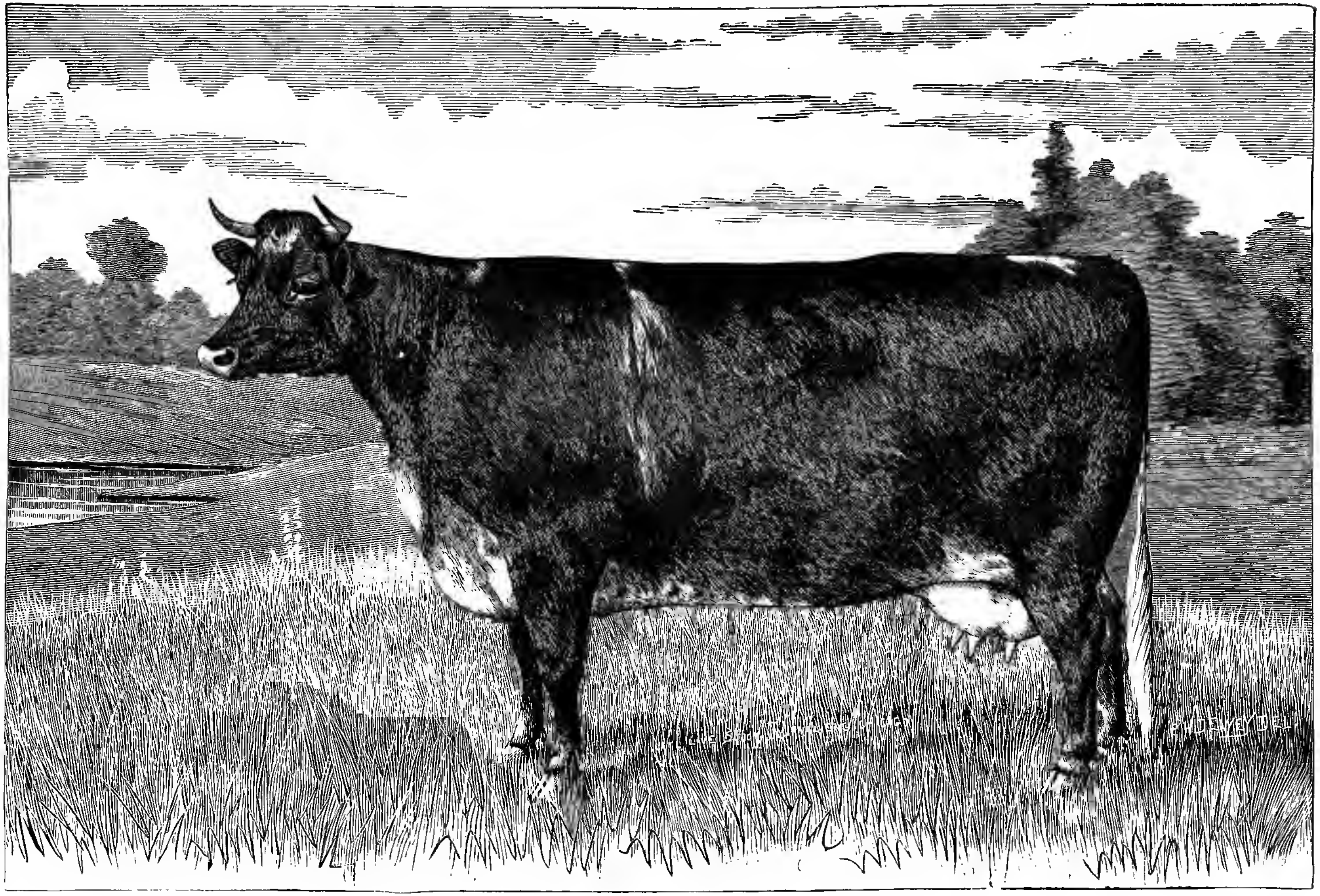
Dairymen have advantages for producing milking stock which those not in the business do not have. They have a herd from which to select calves from the best milkers and best feeders. They can also select a male of good parentage, and from the combined influence of parents on both sides they are almost sure of raising a good cow out of every heifer calf derived from such animals.

It is true that in purchasing, one has a chance to make selections, and it is possible for a good and experienced judge to steer clear of many inferior animal that may be offered him; but do the best he can, he will get more or less stock that will not pay to keep, and must be turned after a seasons trial. It is the general experience of those who buy to recruit their dairies, that they buy two cows to get one to keep. The loss on a poor cow for one season only would nearly pay for raising a good one from calfhood to milking age.

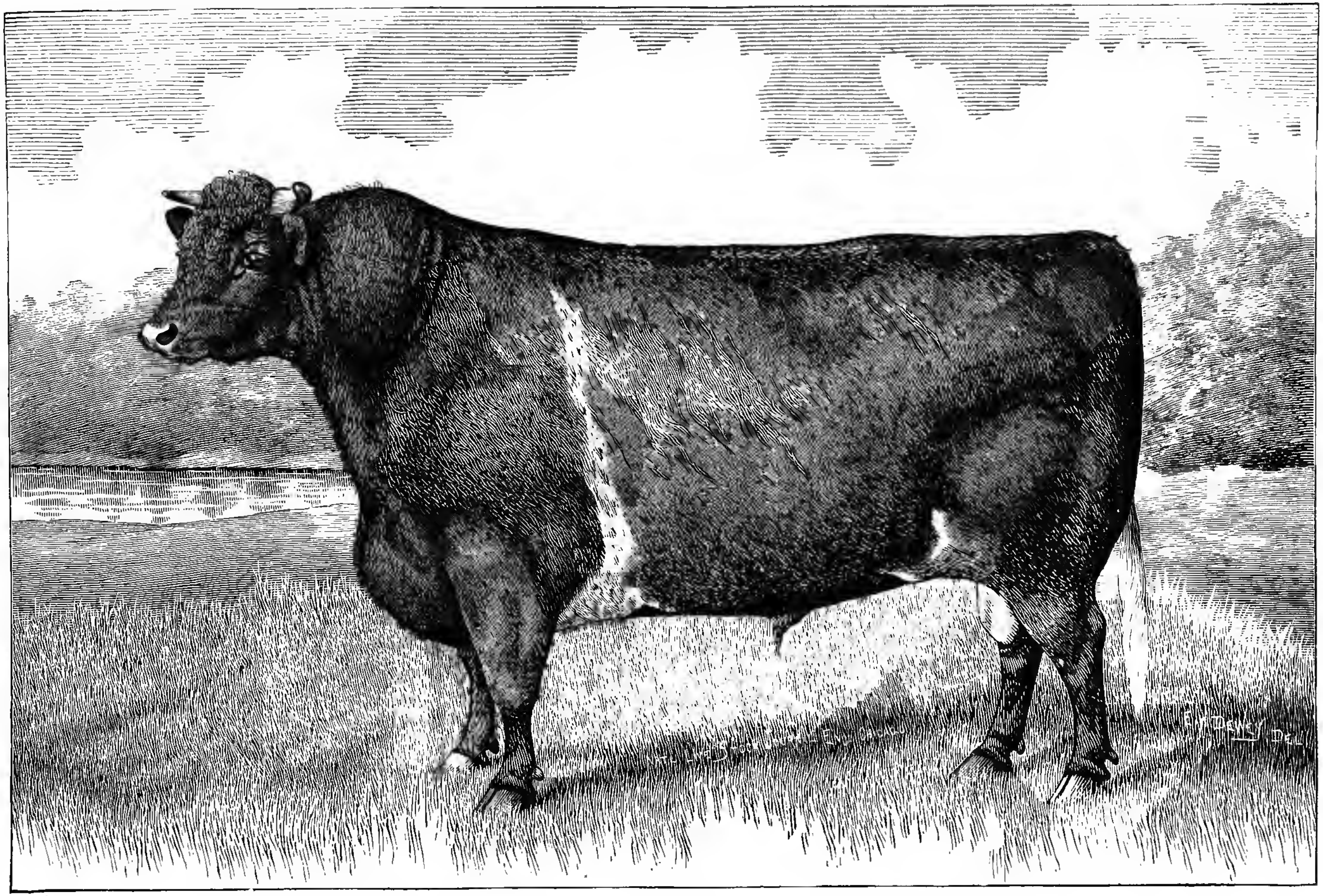
It is true, also, that however careful one may be in selecting calves to raise, he will not be sure of finding a first-class cow in every one he may select, but this will not necessarily cause a loss, though it might cut off profit. A heifer failing to be a satisfactory milker can generally be turned for beef, after her quality has been decided, for as much as it has cost to produce her. In fact, there is but little difference between raising beef and raising milk. There is so little that both are sometimes raised on the same farm, and the profit from each supposed by the farmer to run about alike after counting the cost and labor involved. But when beef is so raised, better beef-producing animals are raised than one would get in attempting to raise milking stock, yet a three or four-year-old heifer of any sort will sell well for beef if of fair size.

The number of milch cows is falling behind the increase of population, and they are growing comparatively scarce and high. The price of good cows is above the cost for raising, and it is to be hoped that more of the calves of good cows will be spared from the butcher's block, to the end that the quality, as well as the number of our cows, may be increased.

To the above sound article from the *National Live Stock Journal* may be added these few words of Col. T. D. Curtis: The better way to keep up and improve your dairy herd is by breeding. In exceptional cases you may here and there be able to pick up cows that will really be an addition to your herd. But the slow and sure way is to get the best male you can for your line of dairying—one good individually and with a good pedigree—and use him in breeding from your best cows. The male is half of the herd in breeding. So you can not afford to have uncertainty on the male side united with uncertainty on the female side. But keep pouring in the pure blood, selecting and rearing the heifers from your best cows, and in a short time you will have high grades as good for all practical purposes as pure-bloods, and sometimes of stronger constitution and better.



SHORT-HORN COW, LADY BELL BATES 5TH.
Property of J. J. HILL, St. Paul, Minn.



SHORT-HORN BULL, BRIGHT EYES DUKE.

Property of H. F. BROWN, Minneapolis, Minn.

THE CHANGES WHICH FERMENTATION PRODUCES IN MILK.

DR. H. FOL.

Milk, if left standing a short time, oecomes a sort of acidulated jelly called curd. In cheese-making this transformation is hastened by bruising; but in both cases the acidity and the peculiar savor of the curdled milk are caused by a microbe, the lactic bacillus, whose little rods swimming by millions in the turning liquid. Only the caseine, the albuminous portion of milk, which forms the principal ingredient of cheese, coagulates: the lactic bacillus, recently studied by Mr. Hueppe, avoids this, and prefers the sugar of the milk, which it changes into a lactic acid. Without the bacillus the milk would not sour. If milk, when fresh, is carefully poured into sterilized flasks and worked, it may be preserved indefinitely. Repeated warmings have the same effect, but the operation is too delicate to be of practical value. If we touch curdled milk with the point of a pin and then plunge the point into fresh milk, in a few hours this milk will also be curdled. This pin-point carries the lactic bacilli in sufficient quantities to sour any quantity whatever of the milk food. By introducing other microbes, milk will undergo a number of dissimilar transformations, according to the germs which are sown in it. The germs of the butyric bacillus condense the milk without it becoming acidulated: on the contrary, it will have an alkaline reaction with a bitter taste, and an odor resembling that of fresh cheese or whey. By adding a little blue milk, in a few hours the whole becomes blue. The milk neither curdles nor sours, but a drop, examined under the microscope, is seen to swarm with vibrios. This is the cyanogen bacillus, and when sown in glue, in potato, or in soup, it everywhere multiplies and makes the substance blue. At times this bacillus causes an eruption, which is cured with much difficulty. Milk is not rendered unwholesome by it, nor disagreeable in taste, but is blue, which does not increase its market value. A little ropy milk added will in three days make milk so thick that we can invert a bottle containing it without losing a single drop. In this case a peculiar microbe, a micrococcus, has been at work. This has been described by Mr. Schmidt-Mulheim, who deserves a place of honor among confectioners, for he has discovered a method of producing a substance much resembling gum-tragacanth, which, when added to the jelly, makes it harden. This milk-jelly is easily digested, its taste is perfect and it may be preserved, even in the air, for ten days. The inhabitants of the north of Sweden preserve the precious microbe, caring for it as the savages care for their fire. They put it in all the milk they wish to preserve, as such milk is better and more easily obtained, in every case, than the condensed milk of the factories of Cham and Montrem. Alcoholic fermentation is produced in milk when sown with koumiss, or with the fungus of k'efir, a favorite Russian drink. This curious ferment is a combination of two distinct ferments—a yeast analogous to that of wine, and a microbe, Dispora-canearia. These two organisms live together in perfect harmony and for a common end—the production of a gaseous, piquant, agreeable, and, above all, healthful beverage. The k'efir is especially valuable as a food for infants and invalids. Several physicians of Geneva intend to make trials of it, and we are in hope of being soon enriched by the addition of a new and valuable hygienic food.—*Science.*

From an article in the Journal de Geneve.

SIMPLE TEST OF ADULTERATED BUTTER.

Mr. John Horsley, in the *Chemical News*, gives the following simple test for distinguishing butter from its counterfeits, or from butter adulterated with lards or other fats. It is well to begin with two samples —one of undoubtedly pure butter and the other of an article which is known to be adulterated, so that the exact difference between the two when submitted to the test process may be distinctly noticed and remembered. Then have ready two test tubes about four inches high, and place one sample in each about the size of a hazel nut, corking the tubes and marking them so that they will not get confounded with each other. Then take one tube in each hand, grasping it by the bottom. In ten minutes the butterine melts into a clear, oily fluid by the mere heat of the blood (98 deg. F.). Pure butter takes twice as long to melt as butterine, and even then is not so clear and oily as butterine, which is a noteworthy difference between them; this is the physical test. For the chemical test, after the tubes have stood to cool a few minutes, pour on ether to about one-third, fill the tube and cork well. Agitate the tubes—one in each hand—clasping them well. The butterine readily dissolves into a clear liquor, which the addition thereto of twenty or thirty drops of spirits of wine does not disturb or precipitate; but a similar experiment with pure butter produces a voluminous white precipitate. Hereby we can easily distinguish one from the other. Even butter adulterated with a portion of oleomargarine or butterine may be detected by a precipitative being formed. A few trials will be sufficient to make the experimenter perfectly familiar with the difference between the action of the two substances.

FOOD OF THE DAIRY COW.

GILBERT MURRAY.

The chemical constituents of the food consist of two separate and distinct divisions, the nitrogenous or flesh formers, and the carbohydrates or heat and fat producers. The former, in conjunction with certain mineral matters contained in the food, build up the structure of bone and muscle, whilst the latter are chiefly expended in maintaining the heat of the body and supporting respiration. With the cow in milk there is a continuous drain on the system, and unless the daily rations are sufficient in quantity and quality to meet the demand, the accumulated stores of flesh formers and heat and fat producers laid up in the system are drawn upon, and the animal not only rapidly loses condition, but there is also a diminution in the yield and quality of milk. Success or failure in the management of our domesticated animals largely depends on the skilful selection of food best adapted for the purposes required. The young animal requires food rich in the flesh formers; and how much greater is the requirement of the young, immature heifer, who has to support and increase the frame, and provide the constituents contained in the milk. But we must bear in mind that the digestive and assimilative organs have their limits; hence it is obvious that food containing an excessive quantity, either of flesh formers or heat producers, though probably increasing the value of the manure, do so at the expense of an excessive strain on the digestive organs. The great art of feeding is in selecting the foods most suitable for the purpose in view, without entailing waste or an undue strain on the digestive system. Dealing with the conditions as to atmosphere and temperature which influence the effective results of food, the lecturer laid it down that every cow should have no less than 650 ft. of cubic breathing space; the cold air should be admitted near the floor line, with ample ridge ventilation, for the escape of the vitiated air; the building itself should be kept clean and free from fermenting or decaying animal odors or vegetable matter (underground drainage, however skilfully executed, is an utter abomination to a cowshed); all the inside walls should be limewashed at least twice a year, and the beds, floors and passages well washed and scrubbed once a week. Whatever tends to increase the health and comfort of the animal economises food, as well as increases its effective results; every source of irritation, whether in the field or the stall, entails an undue waste of food, whilst for the time it reduces the flow and deteriorates the quality of the milk. The quality of the drinking water has a much greater influence on the yield of milk than is generally supposed. Soft water is preferable to hard: hence the water from running streams or ponds is preferable to well water, which is generally at a low temperature. The action of the atmosphere on ponds or reservoirs has a softening influence on the water, a favorable condition for milk cows; impure or tainted water should be excluded. Unlike the food, a portion of the water taken in by the cows passes direct to the third stomach, and enters at once into the circulation. The influence of the food on the yield of milk is well known to every experienced dairyman. Chemical investigation proves that the milk solids are only slightly affected by the food, the caseine and sugar being nearly stationary, whilst the quantity of butter fat varies considerably; the greatest variation is in that of the watery constituents, due in great measure to the quality of the food. The following table is a help towards the judicious selection of foods:

	Flesh Formers. Per cent.	Heat and Fat Producers. Per cent.
Decorticated cotton cake contains	40	55
Undecorticated cotton cake contains	25	43
Linseed cake contains......	28	53
Rape cake "	33	52
Locust beans "	10	70
Linseed "	25	100
Rice meal "	10	46
Palm-nut meal "	18	96
Indian corn "	18	68
Peas "	25	60
Beans "	23	48
Barley "	15	68
Oats "	18	63
Wheat "	15	68
Turnips "	5	8
Mangles "	8	10
Meadow hay "	10	50

From this it is obvious that decorticated cotton cake exclusively used as an auxiliary in conjunction with large quantities of roots and hay, is not an economical food for dairy cows, owing to the large percentage of flesh formers it contains, whilst practically cotton cake, though admirably adapted for rearing and fattening purposes, when given to milking cows in quantities of 4lb. to 6lb. per day produces a leathery cream, and certainly not what the Yankees term a gilt-edge quality of butter. A mixture of pea and palm-nut meal will produce a rich milk, though not of the finest quality. A mixture of rice and linseed meals will produce a large yield of butter of a somewhat oily character. If quality is, as it should be, the chief desideratum, nothing can equal the home-grown cereals—beans, peas, wheat, barley and oats; under ordinary circumstances these will produce a quality of milk, cream and butter that cannot be surpassed.

[From Lecture at Sudbury, Eng.]

WINTER DAIRYING.

HON. HIRAM SMITH,

On the principle that "Money saved is money earned," modern dairymen are learning that cows coming into milk in the fall or early winter, bring in a much larger revenue than summer dairying. In summer, when cheese sells for eight cents and butter for twenty cents per lb., milk is worth net per 100 lbs., 65 cents. In winter, when butter sells for 35 cents per lb., and skim cheese at 5 to 6 cents per lb., milk is worth net to patrons, $1.40 per 100 lbs., or more than double between extremes. Experience teaches that a well fed winter cow will make more butter in a year than a summer cow, mainly for the reason that she holds in milk longer in warm weather on succulent food than she will in cold weather on dry food, thus lengthening the milking season, increasing the product and obtaining a higher price for what is produced, practically making a success where the reverse would leave no profitable returns.

There are many tangible advantages that favor winter over summer dairying. It more equally distributes the labors of the year; the larger portion of the milk coming between October and May, when there is more time to milk, cut and mix feed properly, and to always do the right thing at the right time. In summer, the smaller portion of the milk makes less encroachment on the time of the farmer, and he can better attend to planting, cultivating and harvesting his crops. Hired help is more easily procured by the year than for eight months in summer, and then turned out at the beginning of winter to shift for themselves, some to loaf at the saloons and spend their summer's earnings, others to go to the lumber camp, the mines, or to the far West; all the best of them never to return, making good help scarce the following spring, and consequently higher wages have to be paid for poor help, than good could have been obtained for by the year. Reason, logic, and actual transactions demonstrate that good help can be had at about the same price by the year as for eight months. Crowding nearly all the work of a dairy farm into eight months, necessitates hurry, neglect and waste, only to result in the lowest price for dairy products, when the cows give the largest flow of milk, and consequently the least milk when products are at the highest price. Increasing the revenue without materially increasing the expenses, is tantamount to lessening the cost of production.

To sum up the whole matter, it resolves itself into this proposition: that a farm that will support forty cows when needlessly exposed to outdoor storms and indoor cold, would with the same feed in warm stables, and protected from storms from without, be ample to feed forty-five cows. If the average receipts from such cows is $35 per cow annually, the five additional cows would make a net gain of $175. If this same farm will support forty-five cows mainly on pasture grass, hay, corn fodder and straw, it would if part of the pasture and part of the meadow were planted to field and fodder corn, and fed to the stock, together with twenty-two tons of bran and five tons of oil meal, costing about $375, be ample to support fifty cows, and would in consequence of the proper mixture of feed increase the production of milk to the value of $10 per cow, a gain of $500; and for five additional cows, $175; add the gain for five cows from forty to forty-five, $175, making a total gain of $850; less bran and oil meal bought, $375, leaving a net gain of $475.

This gain is attained by the substitution of warm stables for cold ones, and by the proper mixture of feed, exclusive of the bran and oil meal bought to make the mixture desired.

Add to this the gain of winter over summer dairying as follows: A farm that will support fifty cows that produce an average of 4,500 lbs. of milk per cow while engaged in summer dairying. This milk would be worth not to exceed 90-100 per 100 lbs. or 225,000 lbs. worth $2,025; while on the same farm, same cows and same feed, if devoted to winter dairying would produce the same of milk, worth on an average $1 33-100 per 100 lbs.; and on the 225,000 lbs. of milk, $2,992; a gain for winter over summer dairying of $967, which added to the former gain of $475 obtained from warmer stables and properly mixed feed, makes a total gain of $1,442; a sum larger than the original receipts from the same farm with forty cows.

This is no fancy sketch of fine spun theory made out of the wild guesses of amateurs; but the statements above are actual transactions in my own experience in the past twelve years in bringing a farm of two-hundred acres that would hardly support forty cows the year round at summer dairying, until it now supports fifty-seven cows, by the purchase of a little bran and oil meal to mix with the products of the farm. This statement is not made because it is in any manner remarkable or very creditable, but only to show the successive steps taken towards higher possibilities. As population increases land becomes more difficult to obtain, and many farmers desire to emigrate to where they can have larger farms and keep more cows; but there is ample opportunity for most dairy farmers to emigrate right on their own farms, and by improved care and feeding, to double the value of the productions of their farms.

From Address to Northwestern Dairymen's Association.

Mr. Smith has fixed his standard of 100 cows to be wholly and well fed on the product of 200 acres. Mr. Smith believes in good feeding—profitable feeding—and when he succeeds in feeding profitably 100 cows upon the product of 200 acres, he will be entitled to much credit for its accomplishment.—*Live Stock Journal.*

DOWN WITH FRAUDULENT BUTTER.

JOS. H. REALL.

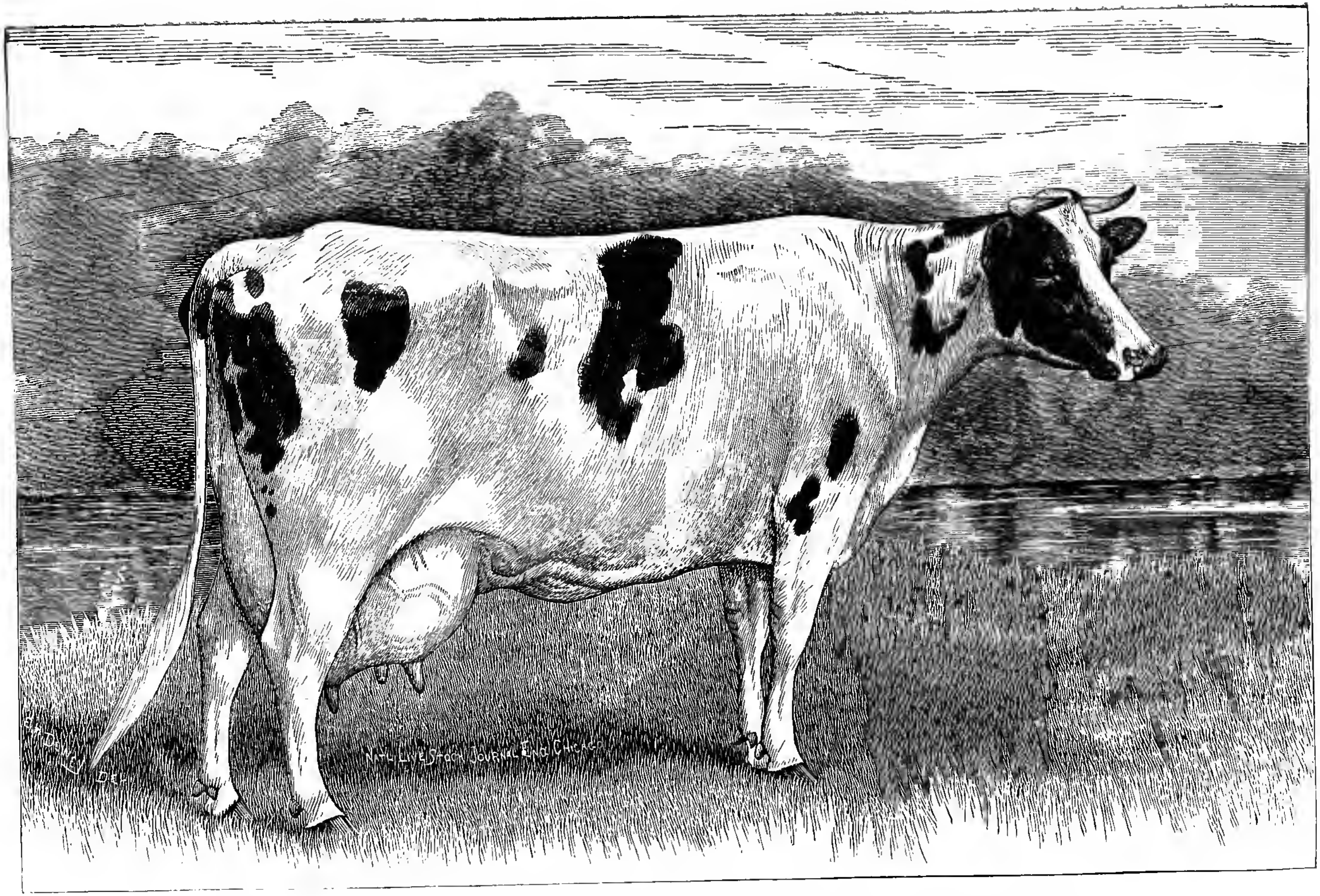
For twelve years the manufacture and sale of counterfeit butter has been steadily increasing in the United States. Begun in New York with the use of beef fat, it has extended to every principal city in the country, and lard has become the principal article in its production. The traffic has grown to hundreds of millions of pounds annually, and new establishments are springing up daily. A market has only been found for the stuff through fraud and deception of the most criminal character. It has been shown that not five per cent. of the entire amount consumed from the beginning until now has been sold under its own name. It has been disposed of for genuine butter, at the price of the natural article, and the public swindled in a leading article of food, while the dairymen have had to meet this kind of dishonest competition. By the dishonesty and greed of manufacturers and dealers, the consumers of butter in every city in America and Europe are cheated and humbugged, and butter-makers from Maine to California ruined in their business. Year after year the friends of the farmer have hoped to see the evil decline; stringent laws have been passed by the legislatures of the different States; but in the face of all effort, and regardless of all laws, the outrage against producer and consumer continues and its proportions increase. Dozens of new factories for the manufacture of the stuff are now being established and the natural product of the dairy, after selling for months much below the cost of production, has declined in price at a period of the year when the production decreases, and prices always advance. Genuine butter is now a third less in price than it was a year ago, and a half less than two years ago. Butter-makers have improved their product nearly fifty per cent. in the past five years by adopting new methods and employing the utmost skill, only to find ruin before them. Dairying, which was one of the greatest industries of the nation and a chief source of its prosperity and hope, is now being destroyed, to the detriment of everyone.

Dairy farms and milk cows have declined in value nearly fifty per cent., which represents a loss to the people of the United States equal to half the cost of the civil war. The same loss in trade or manufactures or transportation would have produced a panic. But this falls upon the neglected farmer, who, doing all and suffering all, must submit quietly to fate, for Government is not for him. The public is protected in everything but its food, where most protection is needed. But the time has come for action. If the State will not protect its citizens from imposition, the farmers of America will defend themselves against an enemy that is robbing them of their land and homes. Millions of dollars are combined against them in the manufacture and sale of counterfeit butter, but greater obstacles have been overthrown in the cause of right.

This question leads all others. Party politics, the tariff, civil service reform, taxation and every other issue, sink into insignificance and oblivion before it. It appeals to the pockets of every man owning a cow and an acre of land, and there are seven millions of this class in America. The war of the Revolution was fought when the entire population of the country was but a little over half this number, and it was fought for less reason. Governments have been changed on issues far less important than this; wars have raged for less cause. The time has come for earnest, decisive action.

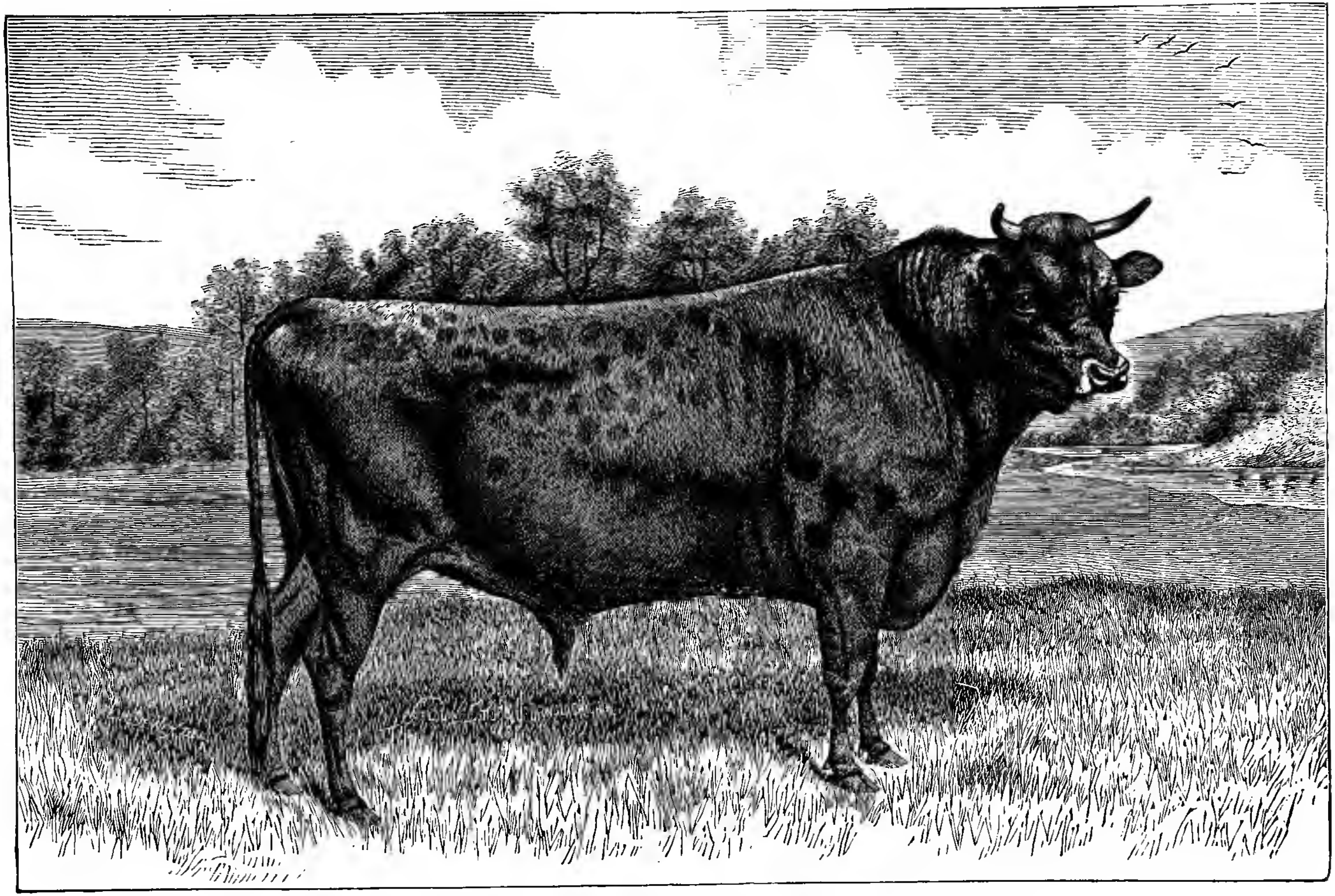
WHY SALT IS USED.

An authority on dairying says that the keeping quality of butter depends, more than on any other one thing, upon the entire removal from the butter of the buttermilk and what the buttermilk contains. Butter is mainly a fat, which fat, purified of everything foreign, will keep without salt if protected from the air. Salt would not help it to keep. Indeed the two things, butter-fat and salt, have no chemical affinity for each other. On the other hand, buttermilk contains a considerable proportion of solid matter of a membraneous or caseous nature, upon which salt has a preservative effect. Butter, as pure as it can be made, by the best known process, will contain more or less of this membraneous and other foreign matter. It will require, at the best, as much salt as would be desirable for the sake of eating quality, to act as a preservative of what foreign matter is inevitable. If an undue quantity of the foreign matter be left in the butter, more salt would be required than would be good for the taste, or eating quality, of the butter. Moreover, while butter, even without salt, is slow to take injury from the air or become rancid, the foreign matter in butter is quick to spoil or become putrid, and salt in any quantity will only keep back the spoiling for a time. From this it will be seen that if the butter is made to contain an undue proportion of foreign matter, it will require, in order to preserve it, so much salt that the taste will be injured, and even then its time of keeping will be limited.—*Ex.*


NAT'L LIVE STOCK JOURNAL ENG. CHICAGO

IMPORTED HOLSTEIN-FRIESIAN COW, LADY PHILPAIL.

Property of FRENCH BROS., Cincinnati, Ohio.



IMPORTED JERSEY BULL, LE BROCQ'S PRIZE.

Property of CHURCHMAN & JACKSON, Beech Grove, Ind.

QUESTIONS ON BUTTER-MAKING.

PROF. L. B. ARNOLD.

A Canadian dairyman has asked me to answer the following questions. He asks:

> Butter churned at too high a temperature is light-colored. Why?
>
> Butter that has been well churned by much working has its color depressed and its flavor lowered. Why?
>
> Butter that has lost its color and flavor by much working will not keep. Why?

An answer to these questions can be made intelligent only by reference to the structure of the fat globules in milk, about which there have been, and still are, wide differences of opinion. Some hold that the fat in milk, of which butter is made, exists in homogeneous spheres that are covered with a membraneous envelope which is ruptured and torn off in churning, leaving the particles of fat naked and free to unite and form butter. This is the most commonly accepted theory. Others believe the globules are enclosed in a caseous or cheesy covering; and others still think they have no covering at all, but are simply suspended in the serum of milk; and some even suppose them to be in liquid form, though the temperature may be much below the one at which the fats composing them are solidified. Just how these little globules of fat in milk are constructed and covered has never been satisfactorily demonstrated to the scientific world, but the latest discoveries with the microscope have thrown so much light upon the subject as to make their condition pretty clear.

Before we can know their structure and behavior we must understand the peculiarities of the liquid portion of the milk in which they are suspended. Milk is chiefly composed of water, in which is dissolved a little sugar, which tends to increase the specific gravity of the water. Second, there is a very little albumen (resembling white of egg) existing in the water, which is also in solution, and as transparent as the pure water itself. Besides these there is cheesy matter (caseine) in a condition partly liquid and partly solid, and of a white color, to which the whiteness and opacity of milk are chiefly due. Caseine, as it exists in milk, is so much of a solid as to have a little tenacity or adhesive quality like glycerine or syrup, thinly dissolved, to which the sugar and albumen probably contribute. In the serum of milk containing these substances granules of fat are suspended, which constitute the basis of cream and butter.

Whence are these little round specks of fat in milk derived? Dissections of the udder show it to be filled with milk tubes branching into hundreds of thousands of minute divisions, with a rounded enlargement at the end of each division, forming a sack or cavity, usually called a follicle, which sustains about the same relation to the tube of which it is the termination, that the head of a common pin does to its stem. With the aid of the dissecting knife and the microscope, the origin of the fat globules in milk has been traced to the interior walls of these cavities or enlarged terminations of the final divisions of the milk tubes. Their formation is not instantaneous, like shot from passing melted lead through the meshes of an elevated sieve, but by a steady process of growth, like the development of an egg. There is a striking similarity in the formation and development of eggs and milk globules, though very unlike in size. Both start from a nucleus, around which matter, differing in composition and consistency, is deposited. The first deposit in the egg is yolk—the hardest part of its substance, and of a yellow color. The first deposit in butter globules is stearine, the hardest, whitest fat in the globule. Outside of the yolk is found the hardest layer of albumen, and on this successive layers of albumen, each of softer consistency; and so in the butter globule, the hard white fat in its centre is surrounded by the softer oleine, and this in turn by still softer oils carrying color and flavor. Upon opening the ovary of a laying fowl one sees eggs in all stages of development attached to the ovary; and on opening one of the cavities in which butter globules are formed, by aid of a microscope, he finds them in all stages of growth adhering to the interior walls of the cavity. The analogy goes still further. As the egg, during its whole period of growth, is enclosed in a delicate membrane, which enlarges to keep pace with the growth of the egg, so is the butter globule during its growth covered with a similar membrane. When an egg, at the completion of its growth, is severed from its connection and is lying in the ovary, the exterior of the very delicate membrane enclosing it becomes covered with a firmer one and a shell, the materials for constructing which exude from the walls of the ovary, and crystallize, as it were, on the surface of the egg. The liquid part of milk, with its sugar and albumen and caseine, exudes from the interior walls of the cavities, in which butter globules are formed, just as saliva exudes from the lining membrane of the mouth. When the globules have become ripe, and, like eggs, have severed their connection with the membrane to which they had been attached, they fall into the liquid milk and with it are carried out of the cavity into the tube connected with it, and on toward the teat, and in doing so they become coated over with the semi-liquid caseine which adheres to their thin membraneous covering so tenaciously as not to be easily separated, virtually forming a second envelope corresponding to the shell of an egg, but, of course, much softer. When globules from freshly-drawn milk are put under a good microscope, there can be seen a profusion of white caseine attached to them, a part of which will be easily separated and adhere to the glass slide by carefully moving them, but a part of the caseine will still adhere, and that quite firmly, and with indications that it is in a measure coagulated, for by washing the globules by causing them to rise two or three times through a foot of clear water and then placing them again under the microscope, they will still be found covered with a coat of apparently solid caseine, which the water has failed to dissolve away as it should if the caseine next to the membraneous covering was not coagulated.

Recent investigations with the microscope go to show that when churning is well and skillfully done the coagulated caseine is worked off from the globules, leaving them whole and with their membraneous covering still on and unbroken, a state of things quite different from what the theories of dairy philosophers would indicate.

When cream is churned too warm, the globules become so adhesive as to unite before the caseine is all off from them, and very likely take in some with their load of caseine all on, and its presence whitens the butter. This is the answer to question (1). When butter thus churned comes to be cooled and carefully worked, its color will be somewhat improved, because the caseine will be more or less worked off and hid beneath the higher colored fat, which will be more exposed to view and cause the color to deepen to some extent, but the presence of so much caseine will prove unfavorable to keeping.

(2). The reason why butter which has been well churned loses color by much working is, because the force applied breaks the globules and exposes the hard white stearine and margarine in their centres, and hides, in part, the coloring which is on their outer parts when they are whole, and this displacement of their constituents also changes the flavor.

If we put into our mouths butter composed of globules in their natural and unbroken state, with their flavor as well as their color in their exterior parts, that flavor makes the first and the deepest, and, in fact, the only impression upon the organs of taste, and getting, as we do, all the good flavor there is in them, we praise the butter for its excellent relish ; but if, by much working, the globules are broken up, and the flavor mixed with and hid beneath the stearine and margarine which generally constitute about two-thirds of butter, instead of the flavoring oils, these constituents of tallow come in contact with the organs of taste and give us more the flavor of tallow than of butter, and what might have been first-class butter is suspected of being oleomargarine.

(3). If the granules of fat, of which butter is composed, can be kept whole and the pellicles which cover them unbroken, though extremely thin, they serve to protect against contact of air and the attacks of germs, and hence they, like eggs in the shell, retain their excellence for a long time; but break the granules and mix up their parts, and you have a parallel to broken and poached eggs. With their contents exposed to the air and badly mixed, decomposition is imminent.

SOFT CHEESE MAKING.

H. M. JENKINS.

Cheese is not regarded exactly in the same light in France as in England. In England it is much more of a food, with the French it is more of a flavor. The working classes in both countries use cheese as a food; but in France the skim cheese is, as a rule, softer in texture and more pungent in flavor than it is in England. The kinds of cheese made, even in the north-western departments of France, are almost too numerous to mention, and they present every possible gradation, from the " Suisse double creme," with its extraordinary richness and extreme delicacy, to a farmhouse skim cheese, made for the resident laborers, that would blister an unaccustomed palate. It will be sufficient for me to sketch briefly the processes of manufacture relating to a few different types of cheese, made from cows' milk, in the district of France which I have already defined. These are (1) the " Bondon" or " Neufchatel," with its more luscious outcome called " Suisse," and " Suisse double creme ;" (2) the " Camembert," which stands in the first rank of French soft whole-milk cheeses."

The headquarters of the Bondon class of cheese may be regarded as the district of Bray in the Seine-Inferieure, having the little town of Neufchatel as its capital. In fact, it is known in England better as " Neufchatel " than as " Bondon," and many people are under the impression that the little cylindrical cheeses are imported from the town of Neufchatel in Switzerland. This delusion has been fostered by the fact that the variety of the cheese which has a certain proportion of cream added to the curd, is called in Paris " Suisse double creme ;" but the epithet no more indicates the nationality of the cheese than it does that of the Parish Beadle, who is also known as " le Suisse."

The process of manufacture, as I saw it near Monterolier under the guidance of M. Rasset, fils, the Mayor of that commune, is as follows:—The rennet is added to the milk, in pots holding about three gallons, at its natural temperature as it comes from the cow. Various devices are resorted to in the winter to preserve this temperature without actually warming the milk. The pots may be warmed by immersion in scalding water; a number may be placed in a case, and the interspaces filled up with straw and chaff, well packed in; or they may be wrapped up in the linen cloths which are afterwards used to receive the curd. The rennet being added to the milk, it is left for many hours, even as many as forty-eight, for the curd to be fully deposited; the curd is afterwards placed in a linen cloth, which is suspended from the four corners of a skeleton box, and is there left for several hours to enable the whey to drain off. It is then transferred to a clean cloth, in which it is carefully folded up, and is submitted to pressure for about twelve hours, or at least until the whey ceases to run out; but the pressure is neither very great nor very even. The curd is next passed through cylindrical moulds, and the small cylindrical cheeses thus formed are at once salted on the outside. The cheeses, being then made, are put into a cellar on boards, each one being quite separate from its neighbors. In a few days, more or less, according to the temperature, the first mould, thick and white, makes its appearance, and soon afterwards, especially in summer, the cheeses are sold fresh. At other times the process of "curing" is continued longer, and the cheeses are sold later at higher prices. On the whole, a fairly good maker will raise an average of 10 centimes (1d.) each, and it is reckoned that the milk of an average Norman cow (say 400 gallons) in a comparatively poor district like that of Monterolier will make 4,000 cheeses; this gives an average return of £16 per cow per annum, without reckoning the value of the whey and the calf.

The much richer quality of cheese for immediate consumption, already referred to as "Suisse," and "Suisse double creme," is made near Gournay, and largely in Paris from a curd sent from the same district. For the manufacture of the former a greater or less quantity of cream is mixed with the milk before adding the rennet; and for the latter a large quantity of cream is mixed with the curd after the whey has been expressed either on the farm or in Paris. The mixture of cream and curd, whether made in the country or in Paris, is rolled in cylindrical lumps, weighing about three ounces each, in paper bearing the name, address, etc., of the maker. These little cheeses are carefully packed in boxes lined with clean, well-cut lengths of straw, which are also used to keep the rows of cheese in the box from impinging upon each other. The price realized for the cheese very much depends upon its appearance when sold to the *restaurateur* or the private consumer; therefore great care is bestowed upon all the details of the packing. The straw is carefully combed to get out all leaves and adventitious matter, and is then cut by means of a fixed sharp knife into the exact lengths required. It seemed to me remarkable that so simple a process of manufacture should not hitherto have been adopted in England, as such cheese imported from France have a considerable sale in London at high prices.

CAMEMBERT CHEESE.

Of all the soft kinds of cheese made in France, the Camembert, when properly manufactured, is no douht the king. Its rivals are the Brie and the Coulommiers, but the more unwieldy shape and shorter season of the former and the restricted manufacture of the latter deprive their competition of any serious importance. On the other hand, the popularity of the Camembert has so increased the demand that many of the smaller, and especially the newer makers, take too much toll in the shape of cream before they commence the process of cheese-making, and thus tend to kill the goose that lays the golden eggs. When properly made, the Camembert quite deserves the eulogium passed upon it by the reporter of the jury at the Paris Dairy Show. It surpasses in delicacy everything that the ingenuity of the cheese manufacturer has been able to invent to flatter the most fastidious palate. This result cannot, however, be obtained without great care, some experience, and especially a most watchful attention to the process of curing. Many of the successful makers of this kind of cheese believe they possess a valuable secret in their method of procedure, and not unnaturally are averse from giving technical information to a possible competitor or even to an outsider. I visited several Camembert dairies, which are generally situated in the Pays d'Auge, although there are some also in Le Bessin; but I have found it necessary to discard my notes on all but three dairies,—namely, one in Le Bessin, near Isigny (that of the Marquis de Cussey de Jucoville), and two in the Pays d'Auge, that of M. Paynel at Mesnil Mauger, near Lissieux (whose grandmother first made this kind of cheese in 1791, at Camembert, in Orne), and one near Livarot, where I was taken by that disinterested and enthusiastic pioneer of agricultural progress, the Viscount de Neuville, President of the Societe d'Encouragement de Lissieux. Even in these dairies there are differences in the details of the various processes of making and curing, and it must frankly be admitted that Camembert cheese-making is still a "rule-of-thumb" procedure, and has not yet been reduced to scientific principles.

The cows are generally milked three times a day—namely, at 4.30 a.m., 11.30 a.m., and 6 p.m. In most dairies the evening's milk is lightly skimmed in the morning, after having stood twelve hours, and butter is made with the cream. The skim milk is divided into two portions, one of which is added to the morning's and the other to the mid-day's milking. The mixture of the two-thirds whole and one-third skim milk is immediately put into earthenware vessels, holding about twelve to fifteen gallons each, and sufficient rennet is added to make the curd fit to be transferred to the cheese moulds in about three or four hours, or perhaps after a longer interval in winter. It should be mentioned that, before adding the rennet, the milk is brought to about the temperature which it is supposed to have had when it was drawn from the cow—say about 86 deg. Fah. After adding the rennet, its mixture with the milk is ensured by a gentle stirring, and the pots are then covered with a square board. The curd is known to be ready for removal when it does not adhere to the back of the finger placed gently upon it, and when the liquid which runs off the finger is as nearly as possible colorless.

When ready the curd is carefully transferred, without breaking it more than is possible, to perforated moulds of the same diameter as a Camembert cheese (say 4 in.), but about three times the height. The moulds are placed on reed mats, resting on slightly inclined slabs made of slate, cement, or other hard material, and having a gutter near the outer edge. The curd remains in the mould about twenty-four or even forty-eight hours, according to the season, being turned upside down after an interval of twelve to twenty-four hours, that is to say, when sufficiently drained at the bottom. After the turning, the face of the cheese that is then inside the moulds is sprinkled with salt, and about twelve hours afterwards the opposite face and the rim of the cheese are also salted. The cheeses are then placed on movable shelves round the walls of the dairy for a day or two, according to the season and to the capacity of the room in relation to the number of cheeses made daily; and thus ends the first stage in the manufacture of this renowned dairy product. It must be understood, however, that the above description is merely general, and that each maker knows by experience how much rennet of an ascertained strength he should add to the milk, how long the curd takes under different circumstances of weather to become fit for putting into the moulds, how large the perforations in the moulds should be, how long the cheeses should be left to drain in the moulds, how often they should be turned, how much salt should be used, and so on through the whole of the processes which constitute the manufacture and the curing of the cheese.

The curing of Camembert cheese consists of two distinct stages. In the first stage, the cheeses are placed in a thoroughly well ventilated room ("drying room"), on shelves made of narrow strips of wood, having narrow intervals between them, or of ordinary planks covered with reed mats or clean rye straw. The great point is to secure as dry an atmosphere and as equable a temperature as possible, and the greatest ingenuity is exercised in efforts to attain these objects. Generally, the windows are numerous and small, placed at different heights, and furnished with three fittings, viz., with glass, to exclude air but not light when the glass is shut; with a wooden shutter, to enable both light and air to be excluded; and with a wire-gauze fitting, which will admit both light and air but will exclude flies and all kinds of winged insects, which are the great bane of the curer of soft cheese. The cheeses, as a rule, are turned every day at the commencement of their curing, and every other day afterwards while they are in the drying-room, except in damp weather, when daily turning is absolutely necessary. During the sojourn in the drying-room the cheeses show the following succession of appearances:—After an interval of three or four days they become speckled, in another week they are covered with a thick crop of white mould; by degrees the color of this mould deepens to a dark yellow, while the outside of the cheese becomes less and less sticky. At the end of about a month, when the cheese sticks to the fingers, it is taken to the finishing-room, where light is nearly excluded, and where the atmosphere is kept very still and slightly damp. Here they remain for three or four weeks, being turned every day or every two days, according to the season, and carefully examined periodically. When ready for market—that is to say, in winter when they are ripe—they are made up into packets of six, by means of straw and paper, with a skill and tidiness worthy of the reputation of the cheese.

The prices of Camembert cheese vary very much, according to quality and season. A really good cheese should have a mottled external appearance, the colors being a reddish-brown and a dirty yellow, the former predominating. If the color is too bright it betokens a skim cheese; as also does an elasticity or toughness when the cheese is pressed on the face with the finger. The quantity of milk required to make a Camembert cheese varies a little, according to its richness in cream when used for cheese-making. Thus the Marquis de Cussey de Jucoville, who has a dairy of thirty cows near Isigny, makes eight cheeses from 24½ pints of milk, or about three pints of milk to a cheese; but he takes off no cream. He sells them at from 7½f. to 8f. (6s. to 6s. 5d.) the dozen; and assuming that his cows (which are remarkably good ones, and graze on some of the best pastures in Normandy, having a rent value there of nearly £5 per acre), give an average of 550 gallons, their gross return in cheese alone would be £36 per head per annum, if it were all made into Camembert. Indeed, the Marquis himself told me that the average gross return of his cows exceeded £40 per head per annum.

Mons. Paynel, of Mensil Mauger, near Lisieux, received a large gold medal from the Imperial jury in the district competition of 1867. His farming then was similar to what it is now, but was not on so large a scale; and his books showed that in 1865 his fifty-seven cows had given over 320,000 gallons of milk (an average of more than 550 gallons per head). With this milk he had made 2,700 lbs. of butter, 3,125 Livarot cheeses and 59,146 Camembert cheeses (using 3½ pints of milk to each). Putting these products at the prices which a French farmer may obtain for them nowadays, supposing them to be of the best quality, they make a total of over £32 per cow, without reckoning the value of butter-milk, whey, or calf. Considering that the rent of his land is about 56s. per acre, his net return would probably not fall far short of that of the Marquis de Cussey de Jucoville.

THE BEST WAY OF USING SKIM-MILK.

PROF. HENRY NATHURST,

Of the Royal Agricultural Society of Sweden.

This question is one of the most discussed to-day, and many ways have been tried to find out the best. One is to make skim-cheese with or without fat, another is to give the skim-milk to the cows or pigs, and after you have tried all this, you give it to the calves for whom it was produced. If the skim-cheese could be sold as it used to be in some parts of the country, that would be a good way; but the fact that there is an over-production in so many places, has caused experiments in new directions. No doubt the simplest and most natural way is to give the skim-milk to the calves, and we do not only mean the breeding calves, but all classes. The skim-milk is not to be used alone by these young calves, but the fat, taken out by the Separator, is to be replaced by some other fat, and a very good one is oil meal, and very fitted to adjoin the skim-milk for the calves. If you mix one pound of linseed to one gallon skim-milk, you get a mush that will in the best way correspond with sweet milk, if you only remember that the skim milk should always be given fresh from the cow after passing through the Separator, and warmed to about one hundred degrees, which can easily be done by placing the milk-can in hot water. For young calves, the linseed should be crushed and boiled in water to a heavy soup, which you put with the skim milk, or you put the crushed linseed in a tinned vessel, pour hot water over it, and let it stand some hours, and then use it blood-warm with the skim milk. You can make a rule of always giving the milk *warm and boiled*. If you can use steam it is better than boiling over the fire. Buttermilk also can be used in the same way if the calves are not too young. Should the mixture purge the calves, you prevent this by boiling the milk before using it.

The chemical view of such food is:

	Albumen.	Fat.	Hydrocarbon.
100 pounds skim milk	3·5	0.2	5·0
10 pounds linseed	1·7	3·5	1·9
	5·2	3·7	6.9
100 pounds sweet-milk	3·9	3·6	5·0

which shows that the mixture is a good one; and as to buttermilk:

	Albumen.	Fat.	Hydrocarbon.
100 pounds buttermilk	3·0	1·9	5·4
10 pounds linseed	1·7	3·5	1·9
	4·7	4·5	7·3

showing this mixture is fully as good as sweet milk, too. The surplus in the mixture over the sweet milk is necessary, because it is not so easily digested as sweet milk. The most important of all is that the vats should be always well cleaned and the mixture given warm. Experience shows that the calves increase one pound living weight from ten pounds of sweet milk. One pound living weight has at least a value of five cents. The mixture gives the same results, and calculating one pound of skim milk is worth three-eighths cents and one pound linseed two cents, the cost of the mixture is about fifty cents for one hundred pounds, or five cents for ten pounds. By this kind of fattening calves, if all goes well, the skim milk brings three-eights cents per pound, which is a fair profit.

This is no novelty. In Sweden, as well as in Denmark, this kind of fattening has been used with the best results. In Denmark they now begin to keep the calves to about one year's age, then of course replacing the mixture with other foods when they have grown up. The calves do not fatten on skim milk alone, because its composition is not fitted therefor. The albuminous matter is too small because the relation between it and the hydrocarbon is 1:1.9 and in the sweet milk is 1:4.4; and it is this proportion we arrive at by using linseed to the skim milk. Linseed cakes, oats or corn, could not be used with the same results as linseed meal, but are recommended to be given with the skim-milk when the calf begins to take other foods—hay, turnips, etc. Mr. Fenk, in Mariebund, Sweden, got the following results by feeding forty pounds of skim milk, without linseed, but with other chop fodder:

Calf, 190 days old	460	pounds,	sold for	$33.02
" 248 "	540	"	"	34.01
" 256 '	500	"	"	31.58
" 300 "	740	"	"	46.25
" 310 "	800	"	"	50.00
" 340 "	800	"	"	50.00
" 355 "	840	"	"	49.72
" 1 year and 3 days old	737	"	"	43.63
" 1 year and 5 days old	780	"	"	40.61
" 1 year and 53 days old	1100	"	"	79.79

Many of the calves had the fixed milk besides the grass on the pasture. As no linseed was given, the calves did not fatten before they were half a year old. In Alnarp (Swedish College of Agriculture) we raise calves on a large scale with skim milk. As we do not like them fat, they get no linseed. They only get whole milk the first eight days, and after that time the sweet milk is gradually changed to *warm separated skim-milk*. The most we give them is three gallons a day for the first six months. To show the increase of weight obtained by this, not forced and for fattening, not designed feeding, we will give the last weighing (April 20, 1885), as one result of feeding with skim milk. Besides the skim milk the calves get hay, one pound of linseed cake, and one pound of oats every day.

No.	Age in days.	Pounds.	Increased weight per day.
60	221	610	2.40
61	220	500	1.91
62	198	458	1.88
63	196	496	2.10
64	194	424	1.79
66	190	415	1.77
67	190	460	2.00
68	187	420	1.81
70	180	480	2.23
71	178	490	2.30
72	177	422	1.94
74	172	492	2.20
		5,667	Medium increase, 2.05

The birth-weight, eighty pounds each, taken off. To fix the value of the calves in regard to the living weight, one of them was sent to England. The weight was 420 pounds, the age 140 days, and the calf was sold for $23.68. Each calf mentioned above had received 17.65 gallons sweet milk, which makes 212.80 gallons for all; then they had got 3,882 gallons of skim milk, 1,800 pounds of linseed cakes, 1,800 pounds of oats, and 3,600 pounds of hay. The account is as follows:

Twelve calves at $2.10	$25.20
212,80 gallons sweet milk	23.68
1,800 pounds linseed cakes	28.42
1,800 pounds oats	21.31
3,600 pounds hay	18.95
3,882 gallons skim milk at 4½ cents	$174.69
	$292.31
5,669 pounds meat paid with	316.50
	292.31
Gives a surplus of	$ 24.19

If we now say that this $24.19 and the manure paid for the straw and care, the skim milk was paid for at 4½ cents per gallon, which is a good return. It may be observed that these calves were not fattened and that no linseed was given. If linseed had been used a much better result would have ensued. Another thing to be observed and followed is, if there is not a good market to be obtained for one-year-old calves, they can be put on the pasture to be fattened and sold at two years. From all this it seems to me as a good thing to use the skim-milk for fattening calves. It is the most natural way and gives better results than any other way of using skim-milk. Another year will add much experience to these simple facts I have given you here. I have told you our first results, and transfer now the matter for the farmer to try—every one on his place.—*Translated from the Swedish, by Fr. Franzen, Esq., of Stockholm.*

THE INFLUENCE OF BREED ON THE COMPOSITION OF MILK.

P. M'CONNELL, F. H. A. S.

The varying composition of milk depends much on food, season of the year, time after calving, etc., but on breed especially. Natural milk may have as little as 83 per cent. of water with some 5 to 6 per cent. of fats, or as much as 90 per cent. of water with corresponding poverty of everything else. By feeding we can increase the total solids, but not the proportion of any one ingredient. Oil-cakes are not the best foods, for it has been proved that fatty matter given to a cow is not turned into butter, but used up in the body, though it thus indirectly leads to the improvement in the general quality of the milk. On the other hand, albuminoids in the food are directly converted into butter-fats as well as albuminoids in milk, and thus in practice it is found that bean-meal and cotton-cake (decorticated) are among the best concentrated food for cows. Washy food reduces the total solids and increases the water. Exercise tends to the using up of nitrogenous matter, and in cows it is secreted as caseine, so that in a cheese-making dairy the cows should pasture outside, while—as rest tends to the conservation of fats—in butter-making it is found that the animals do best when continually tied up.

The great fact, however, which influences the yield of special components is the breed of the animal. By artificial selection the Jerseys have been developed into a variety which yields milk containing 5 to 6 per cent. of fat (and over). Under the microscope it is seen that the corpuscles are larger than is the case with Ayrshire—which latter have been reared for cheese-making principally, and, therefore, have as much caseine as butter in the milk. By keeping the progeny of the animals with the best milk, and judiciously crossing, various breeds have been developed in the course of time whose glands will yield milk rich in one or other of the component parts, and this irrespective of feeding and treatment. Large butter corpuscles require large gland-cells to form them, and these are the result of development. The total solids depends most on food, treatment, etc., and variation of ingredients most on breed. There is no reason to suppose that any breed has as yet reached its "structural limit," and improvement is to be sought in selection, and using butter and milk tests as a guide.

WHY COLORING IS USED IN DAIRY PRODUCTS.

June butter has long been considered the very perfection of product in the dairy line, and with reason. At that time all the conditions are perfect for producing the best and richest milk. The variety and extent of the grasses, the beautiful balmy weather, not too hot or too cold; the cows have been released from the confinement of the stables, while all nature seems to be in perfect harmony. These are some of the causes that have justly given butter made in June a reputation for the best. One of the qualities which helped to make the record of this month's product was the rich golden color that was not found in any other month. In the good old times when everybody lived up to the golden rule various methods were employed to imitate this particular shade of color, so much desired. Our grandmothers tried carrots, annattoine, curcumia, and many other substances, with only partial success. It remained for scientific thought and research to accomplish perfectly what had been so badly done before, and now the best dairies, creameries and cheese factories are using coloring in butter and cheese to make uniform and perfectly colored goods at all times.

The dairy interests of both Europe and America are much indebted to the enterprise and skill of the dairymen of Denmark for the progress made in improved methods of making butter and cheese, fostered and aided as they have been by the government. This demand for perfect goods meant perfect in color as well as anything else, and some means must be found to accomplish the object.

CHR·HANSEN'S
DANISH
ButterColoR
RENNET EXTRACT,
CHEESE COLOR
THE CHEAPEST.THE PUREST.THE BEST.
WESTERN OFFICE:
17 Dearborn Street,
CHICAGO, ILL.

Mr. Chris. Hansen, of Copenhagen, Denmark, after much experiment and large outlay, found that a pure vegetable oil united with a vegetable color, could be used in larger or smaller quantities in different seasons and the desired shade of color produced. This was a great advance over any of the ordinary methods, and it was not long before Hansen's Butter and Cheese Color was well known, both in this country and Europe as the best and purest article for that purpose. There has been and still is considerable prejudice against colored butter and cheese, but that is rapidly giving way, and the demand is for butter with the June tint, even by those who buy the cheaper grades. Different sections of the country demand different shades. The southern markets prefer a deeper and somewhat reddish tint, while the east calls for a fine straw color.

The coloring of cheese is for the same reason as in butter—to please the eye and give it a creamy appearance. Cheese makers have long used a solution of annato prepared in a crude manner for this purpose, with very unsatisfactory results. The preparation of a standard color for cheese is of recent date, but since its introduction it has grown into favor, so that now most of the best and largest factories are using Hansen's standard color.

RENNET EXTRACT.

The original inventor of pure natural preservable Rennet Extract, Chris. Hansen, of Copenhagen, Denmark, has attained a high standing in the European scientific world through this invention, and has been elected honorary member of scientific societies, as his invention has done wonders by improving the general qualities of the cheese. How much cheese is annually spoiled through poor rennets, can only be guessed at by those who have occasion during the summer to smell the rennet jars in a large number of factories. In fact the annual loss to the cheese makers of this country by the use of poor rennets would pay for the Rennet Extract that would be required in all the factories.

CHRIS. HANSEN'S LABORATORIES.

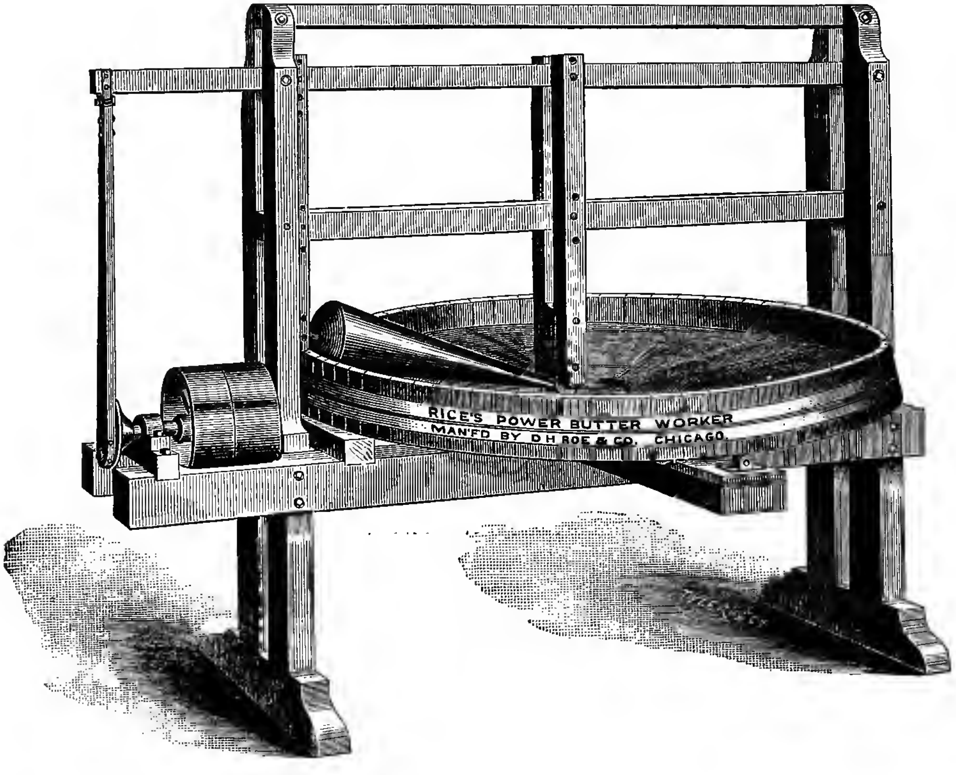
About 15 years ago Chris. Hansen made his inventions of the above preparations and established his laboratory in Copenhagen, Denmark. The sales increased and Hansen's name soon became a household word in the dairies of Europe, from northern Russia to southern Italy. In 1878 a laboratory was established in New York city, which, however, was moved to Little Falls in 1883, especially on account of the fine pure water, which is essential to make a good Rennet Extract. This year, owing to the increasing growth of the Western dairy interest, a western branch office was established at No. 17 Dearborn street, Chicago, Ill. Hansen's preparations are now sold all over the world, and the best dairymen endorse them highly. In 1884 they received diplomas at the international health exhibition at London, England.

The shippers of the famous Danish Butter for tropical countries DEMAND THE EXCLUSIVE USE of HANSEN'S BUTTER COLOR by their butter-makers.

IMPROVED APPARATUS.

The firm of D. H. Roe & Co. has been identified from the first with nearly every improvement in Cheese-Making Apparatus introduced to the trade, prominently among which stands Wire's Circular Self-Agitating Cheese Vat, which was brought out quite recently, and in point of labor saving and perfect control of all the elements that enter into successful cheese-making, can be safely said to be as great an improvement upon the old factory methods as the vat with heater was upon the copper kettle.

A very great improvement has also been made by this firm within the past two years in the construction of vats for ordinary factory and creamery use, which is proving exceedingly popular wherever introduced, and commends itself at sight to the favor of everyone. The expense of shipping ordinary vats holding five or six hundred gallons, on account of their great bulk and the frequent injury in transportation, are well known to everyone. Very few shops in the country, not especially fitted for the business, have either tools or materials for making such work to advantage, and the usual construction does not permit shipping them knocked-down successfully. Roe's Union Vat is designed to remedy all these difficulties. The materials for this vat, when shipped knocked-down, are very easily put together without special tools, by any ordinary mechanic, and when set up make beyond comparison the strongest, neatest and most convenient and durable vat used, and one that literally cannot leak. As freight when shipped knock-down is only about one-third that of vats set up, this new style will be found much the cheapest in a large majority of cases.



The assortment of Cheese-Making Apparatus now controlled by this firm is without question more varied and complete, and includes more improvements than that of any other manufacturer. They are determined to be in the front rank also with butter-making apparatus, and although until recently they have devoted very little attention to this branch of the business, they already have some specialties that give promise of great success. One of these is Rice's Power Butter Worker, illustrated in the accompanying cut. There is universal complaint that the power-workers heretofore employed are imperfect machines and injure the butter. So great has been the dissatisfaction with them that some of the best creameries have refused to use them altogether. This new machine is the invention of a practical buttermaker, who has developed the principle by actual experiment in his own factory. Its essential difference from all others consists in the manner in which the roller is supported and driven.

Important improvements in jacketed cans and setter pails are also promised by Messrs. Roe & Co. in the near future. Only the best materials are used in all their work, and the utmost care is exercised to send out only such goods as will do themselves credit and please their customers.

A large building, five stories and basement, at Nos. 253 and 255 Kinzie Street (near State Street bridge) was constructed especially for them about one year ago. The location is central, within a minutes' walk of all the depots and principal hotels, and they cordially invite all interested in the butter and cheese trade to call upon them whenever visiting Chicago.

A CHAPTER ON SALT.

The use of Ashton's Factory-Filled Salt in butter-making enhances the value of butter from one to five cents per pound, as compared with the use of any other brand of salt. Six pounds of salt are usually required for the making of one hundred pounds of butter. One sack of Ashton's Salt will make thirty-seven hundred pounds of butter; therefore the use of it will make a sack worth thirty-seven dollars, in the mere enhancement of value of product over the use of any other brand. It is not safe to take other salt as a gift.

To make cheese, two and one-half pounds of salt are required to make one hundred pounds.

The extra cost of Ashton's Factory-Filled Salt above other brands will not exceed, for the manufacture of one hundred pounds of cheese, one cent and a quarter, calling the cost of Ashton's Salt double the price of ordinary brands of salt.

The enhanced value of cheese by the use of Ashton's Salt is, in the opinion of experts, one-eighth of a cent per pound—equal to twelve and one-half cents per one hundred pounds. It is not safe to try to save a cent and a quarter, in view of a gain of twelve and a half cents in the making of one hundred pounds of cheese.

Every manufacturer of butter and cheese, competent for his business, knows that a fine ground salt, and not properly dried, runs out with the milk, leaving no flavoring or curing property behind,

Ashton's Salt is effectively soluble; no other, as at present discovered, is effectively soluble. By using fine salt, that runs away, weight of the product is lost, and therefore a profit is lost.

It has been demonstrated by practical butter-makers, under the improved and advanced method of manufacturing high-grade butter, that Ashton's Salt attains, and in a pre-eminent sense actually becomes, a make-weight instead of a cause of shrinkage.

Ashton's Salt, under adverse conditions of temperature, chemically containing atmospheric deposits with fatty matter where volatile oils exist, will furnish a flavor more uniform and favorable to a fair profit than can be obtained by the use of any other brand of salt now known on the market.

Therefore, from these dollar-and-cent standpoints, we earnestly ask every butter and cheese maker to test and prove what we claim for Ashton's Factory-Filled Salt.

A. M. Rowe, Esq., Manager of the Vinton Creamery Company at Vinton, Iowa, a practical creamery-man and a thorough business man, whose aim is to excel in quality and produce the very best at the least expense, while stinting nothing and using none but materials of undoubted excellence, writes: "I made three tests of Ashton's Salt with results as follows:—March 27th, 1885, took 50 pounds of butter in one lot, and 50 pounds in another lot, both from the same churning and worked both twice, salting one with Ashton's and one with American salt, and the lot salted with Ashton's weighed, after working twice, one pound the most. Second test was handled in the same manner and showed one and one-half pounds in favor of Ashton's. The third test worked in the same manner showed two pounds in favor of Ashton's, and found that salted with Ashton's (using the same quantity of each kind of salt) to be salted heavier than the other. I then tested to find the relative strength of the salt with this result, viz.: that one ounce of Ashton's will make the same result in the product that one and one-quarter ounces of American or one and one-half ounces of Higgins. I would also add that, in my judgment, Ashton's salt imparts a finer flavor than any other salt, and by working only once the gain over the above will be still greater, and believe the opinion that owing to the strength of Ashton's and the gain in the weight of the butter through its use, it would be economy for me to pay full price for Ashton's, even though I were to get the American or Higgin's salt for nothing."

As to the keeping qualities of butter salted with Ashton's Salt, we would say that the awards we secured in New Orleans, as well as those we received in New York in 1878, are a sufficient guarantee of the superior keeping qualities of the salt, and you will please notice that we captured the first prize for best Fine Tub Creamery Butter made during the season of 1884, and this was made in October. We also pack for hot climates, and consider we are safe in using the Ashton Salt. You will also notice that we secured the highest award for best tub of butter made at any time or place, or by any process, and not only this, but our Diamond Creamery Butter has taken more awards than any brand we have ever heard of, which is evidence that we not only make good butter but use *good salt*. We run *twenty-seven creameries*, and have always used Ashton's Factory-Filled Salt, and consider it the best we know of.

Boston, Mass. Simpson, McIntire & Co.

Have used the Ashton Salt for five years. Built and run the first creamery in the State, and have the management of eight creameries now. While a great experimenter with most everything else relating to butter, am satisfied to "stay" with Ashton's Salt.

Winnebago, Mich. A. P. McKinstry.

We have experimented with nearly all kinds of salt. In our judgment your Ashton's Factory-Filled Salt excels. We are pleased to say that we used it in salting our butter which won the *Grand Sweepstakes* at New Orleans.

Le Seur, Minnesota. W. H. Patten & Co.

For sale by R. LESPINASSE, Manufacturer's Agent, Dairy and Creamery Supplies, 92 Lake Street, Chicago, Ill.

CHURNS AND CHURNING.

It is now an admitted fact that in order to obtain the best results churns without inside fixtures should be used, and among the churns answering the purpose best is the barrel, the most popular and best known of which is the Boss Churn, manufactured by H. H. Palmer & Co., Rockford, Ill. That it makes more butter, a superior quality of butter, a harder, better grain butter, is the testimony of hundreds. No churn works so easy, no churn cleans so easy, it keeps out the cold air, it keeps out the hot air, it is perfect, so they all say. First quality of butter can always be made in these Churns, if the cream is taken from the milk when it first commences to sour, and churned in its first acid. If the cream is cold, heat the churn thoroughly with hot water, and vice versa.

BOSS CHURN.

First—Lock the Churn with the hook, *fill less than half full of cream, never more*, because it takes longer to churn.

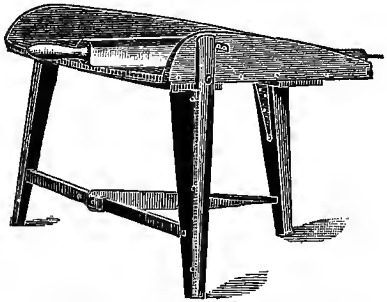
Second—Turn the Churn at from 60 to 80 revolutions per minute for the smaller sizes, 40 to 50 for the larger sizes.

Third—After turning a few times, loosen the cork to let off the gas, and repeat two or three times.

Fourth—Watch the glass indicator, and when the cream breaks sufficient to clear it off, stop.

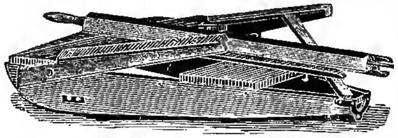
Fifth—Wait a minute for the butter to rise; draw off part of the milk through a fine sieve if the butter is inclined to run out, which is not often.

Sixth—Add plenty of cold water in such a way as to spread the particles of butter as much as possible; swing the churn back and forth, draw off as before; and repeat the process until the butter is as cold as the water will make it, and if your water is in the neighborhood of 50° your butter will be in separate grains, like grain sugar, and will change from one side of the churn to the other, as fine salt is sprinkled in. Do this thoroughly, using 1½ ounces to the pound, as a portion will drain off with the brine. After standing awhile to dissolve and strike through, remove the cork, close the churn and it will usually drain dry enough to pack, which should be done by carefully pressing it together in the tub.



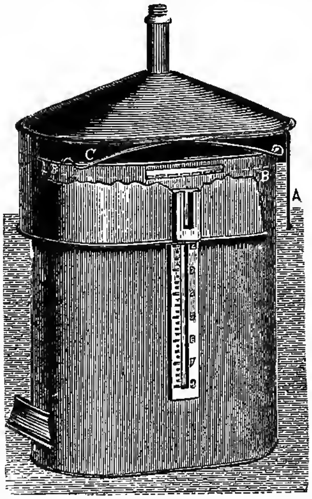
BUTTER WORKER—Open for use.

The same firm also manufactures a Lever Butter Worker, made of thoroughly seasoned hard maple, with perfectly tight joints and a firm, strong folding frame, as shown by the illustrations.



BUTTER WORKER—Folded for shipping.

Another production of this factory is The Farmer's Vacuum Creamer, a simple process for raising cream. A simple little brass spring is soldered to the inside of the flange of the cover in such a manner as to rest on the top of the can. Now when the cover is pressed down the length of spring, one inch, air covering the whole size of the cover is forced out through the top tube, which is then sealed with a cork or cap; the spring then raises the cover. The water which is designed to cover the flange of the cover, which is about six inches deep, prevents the air from going in, so we obtain a partial vacuum in the simplest possible manner. There being no pressure of air on the surface of the milk in the can, the cream rises rapidly. The can being oblong in form presents a greater radiating surface in proportion to its contents than a round can.



THE FARMER'S VACUUM CREAMER.

For full information on these goods address the manufacturers, H. H. Palmer & Co., Rockford, Ill.; or R. LESPINASSE, Manufacturer's Agent, 92 Lake Street, Chicago, Ill.

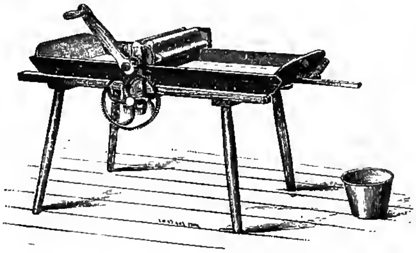
THE WATER'S NEW BUTTER WORKER.

This machine is the latest invention in the worker line, combines more essential points than any other, and recommends itself to all who examine it. It is durable, efficient, economical, and saves labor, time and money. It challenges a comparison or trial with any other Butter Worker. It is a necessity to all butter makers, whether the amount made is great or small. One pound or eighty pounds may be worked and salted at once, more evenly and thoroughly, in less time and with less labor than is possible by hand. Among the important advantages which are claimed for this worker are

Simplicity of Construction, its parts are few and simple.

It is provided with legs of its own, no extra table is needed.

The Tray is not Incumbered with Gearing or Metal, to come in contact with the butter, or render the tray heavy and bulky. When desired it may be readily taken off from the frame for any purpose.



The roller is made from a solid piece, which is turned and so grooved as to leave floats most suited to the work. There are no cracks about it to accumulate buttermilk.

It may be instantly drawn out of gear at any point, which is frequently a great convenience, as it gives the operator complete control of the work.

These workers are manufactured from the best hard-wood lumber, well seasoned and kiln-dried, and are made in a thorough and workman-like manner.

Although it has been but a few months since the Waters' New Butter Worker was patented in the United States and Canada, its merits have been recognized wherever exhibited, and its claims established wherever used, to which the following testimonials bear evidence:

The Waters' New Butter Worker has had a thorough trial on my farm and secured the verdict "A Genuine Success." We should not think of trying to get along without it.

Henry Chase,
Pres. Vt. State Agricultural Society.
Lyndon, Vt., Sept. 1, 1885.

We have been looking these fifteen years for a butter worker that was convenient, handy, and easy to operate, and have found one in the Waters' Worker. If there is one thing more than another to be desired, it is a machine to save labor and take the aching void out of our bones in working butter. Anyone who can turn a grindstone can, with this machine, make butter quick, easy and well. Our hard-working farmers and their wives who have suffered so much and so long, can now throw away their old "Lever Purchase," buy a "Waters' Butter Worker," and rejoice evermore.—[*From St. Albans Messenger.*

I have been using your Butter Worker in the Lamoille Creamery at Hyde Park for the past year and find it fulfills all your claims. I have used different kinds and fail to find any other that will do the work that yours will do in the same time and do it as well. In hot weather I found it of great service as I could get the butter out of the way quicker, easier and in better condition than with any other I ever used.

R. B. Covey.

I have been manufacturing butter now nearly forty years and have always been on the lookout for the best implements to handle it with, but never found a machine to work it, that filled the bill perfectly, until I used the one manufactured by S. H. & W. F. Waters, Johnson, Vt.

Addison, Vt. S. W. Smith.

This certifies that I have used Waters' New Butter Worker for a dairy of thirty cows and can truly say that it does the work in a satisfactory manner, both as to rapidity and thoroughness, working a full tub of fifty lbs. in fifteen minutes with ease.

Johnson, Vt. Gilbert Sawyer.

During the past season we have used the Waters' New Butter Worker and have given it a thorough trial. It has stood every test. It is easily operated and easily cleaned; it does its work perfectly, it has secured for us a higher price for our butter. No buyer could complain that ours was streaked or unevenly salted.

Cambridge, Vt. F. Putnam.

I think your Butter Worker the best of all that I have ever seen. I would not take one hundred dollars for mine if I could not get another like it. It is easy to operate, it works all the buttermilk out and thoroughly works the salt in. I shall recommend it to all dairymen. Yours,

West Concord, Vt. Wm. Douglass.

During the past summer and fall I have used the Waters' New Butter Worker, and have found it to be an indispensable dairy tool. It is not only a great labor and time saver, but with it better butter can be made and a higher price obtained. It will pay for itself many times in a single season.

Johnson, Vt. Howard Manning.

Gentlemen:—I have sold more of your Workers this season than of all other kinds, and have never handled one that gave more universal satisfaction. I shall want them next season. J. C. Moore,
Dealer in hardware and agricultural implements.
St. Johnsbury, Vt.

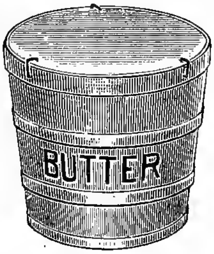
This certifies that I have used the Waters' New Butter Worker the past season, am well pleased with it and would recommend it as excelling any one of former kinds I ever used.

Johnson, Vt. H. A. Waterman.

Orders solicited, and active and responsible agents wanted everywhere. Address S. H. & W. F. Waters, Johnson, Vt., manufacturers, or R. Lespinasse, manufacturer's agent, 92 Lake Street, Chicago, Ill.

ABOUT PACKAGES.

During the infancy of the dairy industry in the United States, if we may so call the period prior to the introduction of the associated system of dairying, the style of a butter package had but little to do with its qualification for market, as it came oftener from a pine box, originally constructed to ship boots to the country store, where roll after roll had been thrown pell-mell for improvement, age and mellowness. Styles of packages were varied and innumerable, and few markets had any special requirements, if there were any at all. But the onward march of progress has wrought wonderful changes. To-day the style of package and its quality, count in the scale of points that goes to show perfection in the products of the dairy. There is considerable uniformity among the various markets as to the preference for hard wood tubs made either of oak or ash. The New York and Chicago markets like such packages holding about 60 ℔ net, with butter packed in solidly. Tubs well soaked in good, strong brine, or else thoroughly steamed and the tare marked plainly on each tub. The same style of packing and packages apply to the Philadelphia market. A spruce tub, in Boston, is preferred to ash or oak, but that preference is much disregarded by shippers, who know well that in case the butter should not meet with ready sale there, it will not keep as well in a spruce as in an ash tub, and would not sell as well in other markets. The Southern markets require packages in the same style as New York and Chicago, and our English friends at Liverpool seem to call for the same packages. There is also a fair demand in all those markets for 25, 30 and 40 ℔ tubs, specially for the trade of the Eastern States.



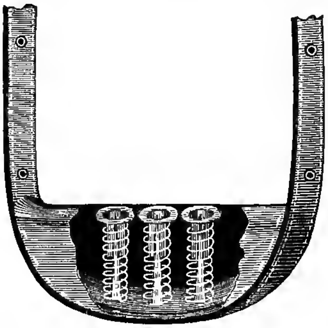
A good butter tub should prevent, as near as practicable, exposure of its contents to the air; the covers should fit close. The work should be done accurately, and the wood free from taint or dampness. That the best butter tubs must come from those men who are conscientious and careful in their manufacture is almost an axiom. The proposition requires neither proof or demonstration. What is true of butter tubs applies equally to cheese boxes.

In the little town of Geneva, situated upon Fox River within a short distance of Chicago, a factory operated by C. E. Mann, Esq., upon the most approved business plans, with the help of skilled mechanics and latest improved machinery, turns out good butter tubs and cheese boxes. None but the very best materials are used; the ash for staves is well seasoned and selected and every detail that tends to make a first-class article observed. This factory has every facility for making the *best white ash* butter tubs at the lowest price possible for such stock, and furnishes many of the largest and best creameries in the Northwest. They also make the choicest of cheese boxes, using a nice white elm for sides and basswood heading. This heading makes a neater and more durable box than can be made of pine, now used by many manufacturers.

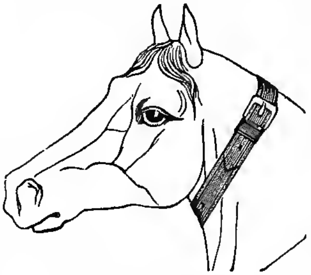
They mean to make no poor goods of any kind.

The facilities of the factory are not entirely limited to butter and cheese packages, Mr. Mann having quite an extensive trade in potato-diggers, and wheelbarrows of his own patterns and manufacture, and also a new and valuable invention known as

GENEVA ANTI-CRIBBER.


Lower Section showing Barbs and Springs.

Cribbing is one of the worst habits a horse can get into, and he will learn other horses to do it. A mare has been known to teach her colt this bad habit. If left to himself a horse will never recover from it as he becomes a "Wind Sucker," and ends with colic or blind staggers. Above cut shows it does not choke the horse or in any way prevent eating or drinking, or even annoy him, unless he distends his throat in the act of cribbing, when the barbs inside the springs will press out and stick him, and he will immediately stop doing it. To put it on, simply buckle it around the neck, not tight enough to force the barbs through the brass eyes of the device to prick the horse. This device is no experiment. Hundreds are in use, and the most hearty commendations are constantly received.


Anti-Cribber on the Horse.

Will be sent to any address upon receipt of price, $5.00. Is guaranteed to do all that is claimed for it, or money will be refunded.

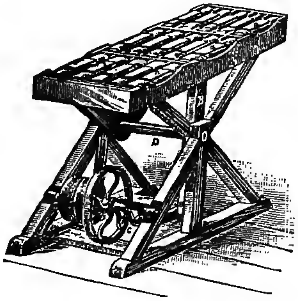
The products of Mr. Mann's factory are already well and favorably known throughout the country, and it needs no assurance on our part to satisfy any one that dealing with him they will receive at all times fair and conscientious treatment. Full particulars about these goods can be had by addressing C. E. MANN, Geneva, Ill.; or R. LESPINASSE, Manufacturer's Agent, Dairy and Creamery Supplies, 92 Lake Street, Chicago, Ill.

TEST CHURNS AND CARRYING CANS.

One of the great points in dairying, whether at the farm or at the factory, is to keep close and accurate tests of the yield, in the case of the farmer of each cow, and in that of the creamery of the value of the milk or cream furnished by each patron.

It has been thoroughly demonstrated that the buying of cream by the inch has proved a decided failure financially to most creamerymen, for various reasons, particularly in the fact that the same quantity of cream raised under different degrees of temperature will produce entirely different results, which is largely the cause of the perplexing question of shortage. It has been proven during the past season that the most practical way of overcoming this shortage is by churning a sample of each patron's cream.

From the testimonials received from those using Cherry's churn, it is proven the cut presented herewith represents the best churn for this work. The churn jars are so fastened in by a spring that they may be removed or put in while the churn is in motion. The oscillating motion is caused by the pitman at C being attached to the lever B B. D is the axle, or center of motion; from this it will be seen that it is the best possible motion for rapid churning, so as not to damage the grain of the butter.



The churn jars are made of tin with glass on the side, so operator can see when churned sufficiently. They are also furnished with a vent tube.

Cherry's Tin Quart Test Collecting Can is decidedly superior to the ordinary glass jars for collecting tests from patrons to be churned, in the fact that they hold exactly one quart, while the glass are not uniform. The number is stamped on top and the covers are interchangeable with the churn covers. By using this can all trouble is avoided in keeping each patron's test separate.

CHERRY'S IMPERIAL REFRIGERATOR CAN.

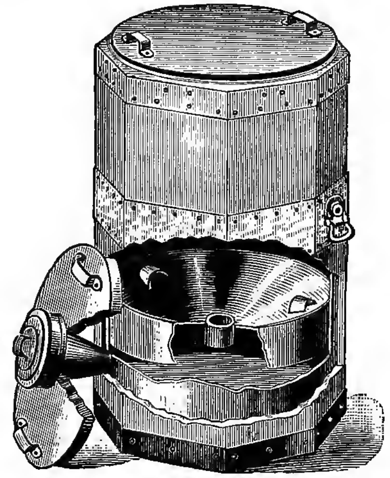
Received first premium at the World's Fair in New Orleans, and awards for excellence wherever exhibited.

Below we give the principal reasons why the Imperial can should be generally used:

1st. It has been tested over three years and has proved itself to be of greater benefit than was claimed for it. It kept the cream from freezing when the thermometer stood at 38 below zero, without any protection, and is even a better protection in mid-summer.

2nd. It is constructed on scientific principles after a great deal of study and experimenting, and is very solidly made. The top and bottom hoops project slightly so that the lumber does not come in contact with each other when traveling. The center has a 5-inch heavy galvanized iron band around—the handles will come in contact with this only.

3rd. Because the can may be removed from the jacket (should it leak) at any time, by removing a few screws from the top; with the can soldered to it, it may be easily lifted out; also should the packing at any time get disarranged, or want replacing, by removing the screw from the bottom, and those in the lumber, the bottom can be taken out and replaced with perfect ease. If a stave should break it can be replaced in the same way.



4th. It is sold as cheap or cheaper than poor imitations that some men are getting up for the purpose of deceiving the trade and reaping the benefits of my inventions, thinking by a slight change to avoid the patent.

5th. There is no danger of having litigations as this is the original and only patent.

Full information about these goods will be cheerfully furnished by the manufacturer, J. G. CHERRY, Cedar Rapids, Ia.; or, R. LESPINASSE, Manufacturer's Agent. 92 Lake Street, Chicago, Ill.

A SAFE OIL COLOR.

Such is the Natural June Butter Color made at the laboratory of the Rockford Chemical Company, Rockford, Illinois.

To every dairyman who wishes to obtain the highest degree of excellence in his productions, this Company calls attention to the following reasons why they claim superiority:

1st—It does not color the buttermilk.

2d—It contains no acids or alkalies, consequently works uniformly, no matter what degree of sourness the cream may possess.

3d—It gives the butter a natural June color.

4th—Butter colored with it brings the highest market price.

5th—It is entirely harmless, saves time, labor, and returns you twenty dollars for every one dollar invested.

6th—It imparts no taste to the butter.

7th—Perfect keeping qualities; it does not mould or sour in any way. It has a decided tendency to preserve butter.

8th—It requires no labor, as it is a liquid that is put in with the cream in the churn.

It is not desirable to use a large quantity of coloring matter in butter, consequently a color of superior strength is demanded by all butter-makers.

The Natural June Butter Color is made expressly to meet this want. It is always uniform in strength and never fails to give a perfectly natural tint to the butter.

Creamery men will find this color perfectly adapted to their wants, because of its *superior strength.*

Order from the Company or through R. Lespinance, 92 Lake street, Chicago.

CLEANLINESS.

However much people may differ on other matters, all are agreed that absolute cleanliness is necessary to the making of good butter and cheese, and the maker who gets a reputation in this particular, will, other things being equal, dispose of his product to better advantage than one who has a contrary reputation.

A want has long been felt for something which, while being entirely free from all noxious fats and greases, would promptly, effectually and cheaply secure perfect cleanliness in and around the creamery, dairy and cheese factory, where it is such an absolute necessity. The Myers' Detergent supplies this want.

" Detergent is a plain, simple compound, perfectly dry, and quickly dissolves (by stirring) in water, (warm is best, if convenient); economical, because 'tis free from grease and water—the latter your pump or spring will supply.

'Tis sweet, clean, and purifying, and valuable in every department of life where cleanliness is desirable, particularly so in the dairy, in cleansing the various utensils used in the manufacture of butter, cheese, etc.

Dr. J. Cheston Morris, the great authority on all milk and dairy subjects, says he finds it superior to soap, as well as cheaper. Hundreds who are using it attest that it fully comes up to all that is claimed for it. One pound is equal to three pounds of any soap or soap powder made. It is useful in the household for cleansing dishes, pans, kettles, paints, floors, etc., as in the dairy or creamery.

Send sample order and get price list. Put up in 8 oz. packages, by the gross, ½ gross, ¼ gross, or any quantity bulk--not less than 10 lbs.

MACDONALD & Co., 13 S. Water St., Philadelphia, U. S. agents. R. LESPINASSE, western agent, 92 Lake St., Chicago, Ill.

CREAM TESTERS.

For testing the percentage of cream in milk, Mr. Wyman L. Edson, of Union Centre, Broome County, New York, manufactures an ingenious combination —a dairyman's practical invention.—It consists of a frame for holding one or more common test tubes graduated into hundredths on standards at the side of the glass, so as to ascertain the per cent. of cream in freshly drawn milk.

By the old method or style of cream guage, which is something similar to a druggists graduating glass, the expense of marking glass brings them so high that for the use of the dairymen it is practically out of their reach, as in order to test a dairy of cows so as to ascertain their relative value for cream, each cows milk must be tested at same milking and under the same conditions, thus necessitating a heavy outlay in order to arrive at a satisfactory conclusion, and if a glass was broken it necessitated as much as original cost to replace it.

In this invention the glasses are well protected by the frame, and not liable to be broken, and if broken, can be replaced at almost any drug store for a few cents.

The glasses can be easily removed to be cleaned, and as easily replaced.

The frames are made of wood in a substantial manner, carefully graduated and varnished, large size holding about two and one-half times as much as small size. Is no more accurate but more convenient. Each size is furnished with a filling glass so as to be easily filled.

Testers with six glasses for testing milk of six cows at same time, price $1.00, large size, $2.00, and will be sent free by mail upon receipt of price.

Agents Wanted—Address WYMAN L. EDSON, Union Centre, Broome County, New York, or R. LESPINASSE, Manufacturer's Agent, Dairy and Creamery Supplies, 92 Lake St., Chicago, Ill.

SEEK THE HIGHEST DEGREE OF EXCELLENCE.

Every year the line is being drawn more closely about dairy products, and each succeeding year brings an increased demand for strictly first-class grades and a weaker demand for the poorer ones. As the supply increases, so does the watchfulness and fastidiousness of the expert increase. He becomes more particular, seeks for a greater number of points of excellence, elevates his standard, and the very slightest defects turns out many tubs into second grades. Excellence of product, then, is the first and chief element of success. Nicety of detail and close attention to even the most minute will fill the dairyman's pocket. Color is one of the essentials and counts somewhat in the scale of points. At the World's Fair in New Orleans last season, the decision for the grand sweepstakes was rendered upon the color of the butter, it being essentially alike in three cases except upon this point. Really the firm of F. B. Fargo & Co., of Lake Mills, Wis., were the manufacturers of the color used, pulled down the balance on the side of the Minnesota tub. Many people entertain the erroneous idea that it injures butter to color it with some pure vegetable compound. Leading dairy authorities recommend the use of coloring and are strongly in favor of it. The best dairymen throughout the United States are of the same opinion and invariably color their butter. It satisfies both dealer and consumer better, and does not, in the slightest degree, injure that delicate aroma which gives to butter its greatest value. Great care should be exercised, however, to obtain a color that is absolutely pure and will not flavor the butter. Fargo's butter possesses those qualifications, and reference to the numerous well-known dairymen who have used this color for years will substantiate the statement. Dairymen should exercise great care in the purchase of their coloring matter, as their highest reputation as butter-makers may be ruined by a single bottle of inferior color.

F. B. Fargo and Co. have had a longer experience in the manufacture of an oil butter color than any other firm in the United States. They were established in 1870 and have been continuously engaged in the business ever since. As a result of their long experience they claim to have attained *a high degree of excellence*, in their color. The stock used is manufactured expressly for them, and is clarified by a process requiring six months' time. The color will never turn rancid and will never flavor the butter. As already stated the prize butter at the last World's Fair was colored with this color. The article itself received first premium over all competitors, and over one-half of the butter to which premiums were awarded was colored with Fargo's butter color. The awarding committee of the Grand Union Dairy Fair at Milwaukee, reported that in comparing butter colored with this color, and Jersey butter on exhibition, they found the shade to be exactly the same. Year after year and great fair after great fair have passed leaving Fargo's butter color a leader at all times, the butter colored with it taking innumerable premiums.

CHEESE COLORING.

Another important product from the laboratory of this firm is a highly concentrated liquid cheese coloring which has been tested for years in first-class cheese factories, and is admitted to be the best by all who have used it. "Send us more," "We are well pleased," Will use no other," "Pleases the trade very much," "We find it the best we ever used, and far the cheapest," such are the expressions used by the cheese-makers who have it in use. This color was awarded first premium at the late Wisconsin State Fair.

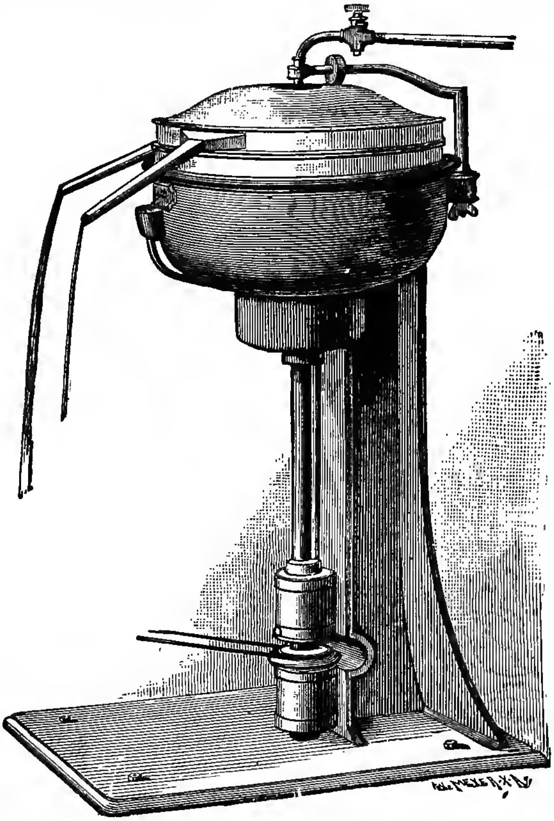
RENNET EXTRACT.

This season the trade has been asked to use Fargo's Rennet Extract, and in view of the well-known reputation of the firm it has received considerable attention and been introduced quite generally with highly gratifying and satisfactory results. Like the other productions of F. B. Fargo & Co., it is a first-class article, strong, fresh and pure. We advise dairymen who desire to secure high grade goods to correspond with F. B. FARGO & CO., Lake Mills, Wis., in regard to coloring and rennet extract.

CREAM BY MACHINERY.

DE LAVAL CENTRIFUGAL CREAM SEPARATOR.

In the short space of two years the De Laval Cream Separator has been introduced in the United States, and six hundred machines sold to some three hundred of the best butter makers and largest creameries in the world. The grand result is, that in face of the novelty of the invention, and the fact that every buyer has had to be educated not only to its advantages, but to its use, every one of these six hundred machines is now giving satisfaction. The Messrs. Darlington, the dollar a pound print butter makers, who have run four of these machines daily for two years, while among the very first buyers, had been looking for such a machine years before the De Laval came to America; and as far back as 1881 had inquired of the writer for a Centrifugal Cream Separator, so that it took these good people some time to get started in the enterprise. Now no money would buy these machines of them if they could not get others; and all the largest and best buyers are of the same disposition. It is a demonstrated success in every particular, and it is becoming more and more apparent that the creamery or private dairymen who practice the old system cannot compete with those who use the machine, for it will absolutely give ten to fifteen per cent. more and better butter, according to circumstances, than any system of milk setting in use, besides leaving the skimmed-milk fresh and sweet for other use. Not only has it been proved that better butter can be made with the Separator, but its keeping qualities are of the best.



The De Laval Cream Separator is without a rival in simplicity, durability, small power required, and results obtained. It never wears out. Those sold at first are as good as new in every instance, and have cost next to nothing for repairs, while they have long since paid for themselves in the extra quantity of butter produced. The De Laval Cream Separator has taken over fifty gold and silver medals in Europe, where over 3,000 machines are in operation, and first prizes at the leading State fairs and expositions in America. It has just been awarded first prize at the World's Fair at New Orleans.

In competition with the principal cream separators at the great London Dairy Fair last fall, it was awarded first prize on every point, as it had previously been by the Royal Agricultural Society of England, and the judges, after an exhaustive competitive test, prepared a full report in its favor on every point, ten in number, embracing:

1. Construction (embracing simplicity of design, facility of cleaning, emptying and oiling). 2. Analysis of skimmed-milk. 3. Analysis of cream. 4. Quality of cream. 5. Temperature at which the milk was separated. 6. The time taken in separating a given quantity. 7. The quantity of milk required to work the Separator. 8. The cost of the Separator, including the intermediate motion. 9. The cost of fixing. 10. The revolutions. 11. The safety. 12. The convenience of delivery of the skim-milk and cream to a higher or lower level. 13. The adaptability for horse power. 14. The intermediate motion, embracing simplicity of construction, readiness of throwing in and out of gear, and any arrangement for neutralizing the effect on the speed, by the stoppage of the horse. 15. The power required to work each machine.

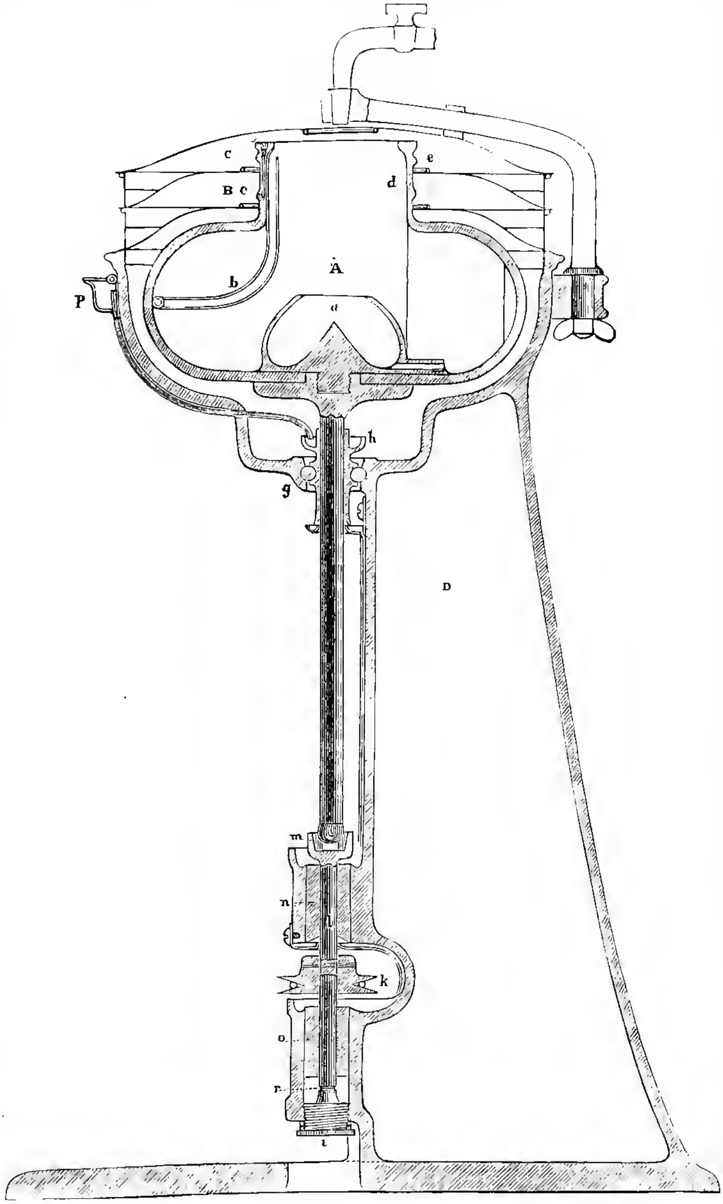
They thus give it the highest recommendation for superiority in construction, operation and results that any implement has ever received, and their endorsement clinches the evidence of the great merits and advantages of this most useful of all dairy appliances.

They state that no butter maker can afford to be without one. They say, also:

"In regard to the essential points of construction, separation, temperature and quality of cream, and analysis of cream, the De Laval was far ahead of its opponents, and quite deserved the Gold Medal given by the Council. The power of raising the skim milk after separation to a lighter level seemed to entitle the large A Danish to a second prize, but the failure to separate the milk satisfactorily debarred the other Danish machines from any further recognition."

This decides beyond question everything connected with the machine, and settles its position as a perfect implement for the purpose designed.

The six hundred De Laval Cream Separators that have been sold are revolutionizing the dairy business of America. If run five hours a day each they handled 2,400,000 ℔ milk daily, 16,800,000 ℔s. a week, and 873,000,000 pounds a year, which yields 39,700,000 pounds of butter a year, and at 15 per cent. increase over other methods, which is less than the average, these six hundred machines are saving $1,500,000 to the dairymen of America already per year, which is ten times their first cost. The expense for repairs has dwindled to an insignificant sum. Now, when 1,200 machines, and 2,400 and 5,000 are running, it will be seen what a saving there will be to butter makers. But it is not only the saving of butter. There is the time to be considered, for, with the De Laval, you can take the cream out of the milk as quick as it comes from the cow, thus doing away with all setting and ice, and securing the skimmed milk fresh and sweet for feeding stock, for which purpose it is considered worth fifty cents per one hundred pounds by high authorities, and this is as much as the farmers in some districts get for their whole milk in the summer.



No man with twenty cows can afford to be without a machine a day, and the more cows he has the greater profit it will be to him. Each one will run 800 pounds of milk an hour, and can be run as many hours as desired, but it is best to have a machine for each 3,000 or 4,000 pounds of milk, so as not to have to give too much time to running it.

C. Brigham & Co., the great milk men of Boston, who now have nine of these machines at different places, state that they have run one of them, the first they bought, ten to fourteen hours a day for a year without repairs. This shows how lasting and inexpensive the machine is. It is practically always as good as new. The experience of this firm, who are the largest milk dealers in the world, and such noted creamerymen and private dairymen as Mellen & Swan, Theo. A. Havermeyer, John and Jos. Newman, Velancey E. Fuller, J. & J. Darlington, who make 1,500 ℔s. of dollar-a-pound butter a week, Wm. M. Singerly, Hon. J. Gregory Smith, Oatman Bros., J. A. & M. A. Howell, J. R. Morin & Co., all of whom have national reputations, and the hundreds of other users of the machine in America and the thousands in Europe, show its value.

No dairyman or creamery will ever regret buying a De Laval Cream Separator. It is the greatest, cheapest and best dairy implement ever invented of any kind, and is without a peer in its line. No implement of any description compares with it, either for the 25-cow dairy or 1,000-cow creamery. All inquiries cheerfully and promptly answered, R. LESPINASSE, Mfrs. Agt., 92 Lake St., Chicago, Ill.

MARKETING DAIRY PRODUCTS.

J. E. KEITH.

The commission-merchant feels no less interested in the success of the dairy and the production of fine goods than the producer. It's a pleasure to sell an article that gives satisfaction. It builds up confidence with your new customers and strengthens the friendship of the old, regular, and steady dealers; whereas poor goods always make trouble and enemies. As the volume of business done by the produce commission-merchant far exceeds the value of our annual grain product, which is nearly double that of any nation in the world, although his duties and responsibilities are great, yet I think he has been entirely overlooked in these conventions—at least I have never heard nor read any special advice to him, enabling him to sell all goods at high prices, quickly, at all times—a request generally made by shippers. It is his duty to carefully and closely watch the conditions of the market, the demand and the supply; to take into consideration the indications of the weather, the keeping qualities of the goods, and exercise his best judgment when to sell; to keep his shippers posted on prices and prospects, the quality of goods desired, and the shape in which they are most salable. Hence, mutual confidence and co-operation are equally beneficial to both parties. It appears a delicate matter, nevertheless, to make suggestions to a shipper as to the defects of his goods. Hence, some commission-merchants always say, "Your butter was very fine—as good as we get,"—notwithstanding it may have sold two or three cents below the top price. Of course they do not mean to prevaricate, but they are careful not to hurt the shippers' feelings. This, I think, is poor policy. The facts are what the shipper wants.

A good butter-maker—intelligent, wide-awake, neat, and systematic, should know enough to know that it does not pay to mix old, frozen, or overheated cream with a good article, but should churn it alone, and keep, pack, and brand it separately; know the effects of a thunder-storm, and when to churn; and should wash and salt the butter as soon as churned We think a great deal of the best butter flavor is lost by letting it stand in open tubs or boxes twenty-four hours for the salt to dissolve. If you work it twice, cover it up meantime as tight as possible, in order that the quality most desired in butter, the flavor, will not evaporate. Never flood butter. Enough water to wet the salt does no harm; but any more gives the tub a wet, dirty appearance by the time it is received by the commission-merchant, and, when he puts his trier into it, the abundance of water is further evidence to the buyer that he must get it cheap or take some other brand. They don't like to pay thirty-five cents per pound for water in Chicago.

After the butter is made and packed, it should be kept in an ice-box or cellar, absolutely alone and free from all bad odors. I have frequently found from fifty to two hundred and fifty tubs in an ice-house with eggs, lemons, and even vegetables. Eggs should never be kept in the same room with butter; they draw dampness from the butter, get musty in the fillers, etc., which is very bad for the eggs and ruinous to butter. One bad egg will spoil a whole carload of butter. Lemons, fruit, and vegetables are always more or less spoiled, and it is very injurious to dairy products. After butter has been exposed to these bad influences, although ever so nice at first, is taken out of the ice house and warmed up in loading to ship, is cooled off in a refrigerator-car, and then warmed up in taking from the depot, and cooled off again in the commission-merchant's ice-cellar, it shows the effects of the bad odors so plainly that nobody, or only a limited few, wants or can use it; hence it takes a long time and hard work to sell it. The shipper has only seen it at its best, and thinks strange that his butter does not sell readily at high prices.

Always ship as fast as you get the goods. Butter and eggs both lose in quality and value (except on rising market), by being held. Some shippers think it a good plan to accumulate a hundred tubs of butter or a hundred cases of eggs, and then divide them, and ship to four or five different houses, to see which can do the best. That is no test at all, for it is impossible to divide them equally as to quality, age, etc. Better ship every day, or two or three times a week, while the goods are fresh; they sell quicker and higher, and give better satisfaction. The country merchant is largely responsible for the poor dairy in not buying butter strictly on its merits, and paying for it only what it is worth.

From Address to Iowa Dairymen's Association.

AN OPEN LETTER.

To the Creamerymen and Dairymen of the United States:

The establishment of a new house to handle Dairy and Creamery supplies cannot well be considered as a necessity "to fill a long-felt want." Long-felt wants in that direction have for quite a while past been filled and refilled and fulfilled. There is no "aching void" left there, my good brethren.

However, we have come, we have seen, and if we have not conquered it is not because we have not tried hard, but most likely because we have not quite learned how to do it, or have not been fighting quite long enough. But of one thing there is a certainty, that we propose to fight it out on a straight line and a square basis, remembering that "Live and let live" is one of the golden precepts.

But we can see, in our mind, a broad smile come across your faces; you have heard such a story before, and are somewhat inclined to daub the writer one of those pesky reformers: and, my friends, that is just exactly where you have missed the mark. We are not at all trying to reform ourselves, but we calculate to put in some valiant licks to reform you. The shoe is on the other foot—do you see? The army of manufacturers we represent comprises some of the best-looking fellows in the world, and they are about the nicest set one can find anywhere. We want to help them in making your acquaintance, and thereby help a poor orphan whose acquaintance we made a number of years ago. These manufac-

turers we are talking about have done much to further your interests and improve your business. Fact, sir, I assure you. Most of them have done well, very well indeed, and the mass of ducats they have amassed has softened their hearts, so that they feel disposed to load you up with goods in exchange for a very small cash consideration, "not necessarily for publication, but as a guarantee of good faith."

Having remained constantly in the ranks, as a high private of the great Dairy army, we do not believe that we can possibly have missed the mark when figuring "that a fellow-feeling makes one wondrous kind," and the boys might come with us if we were clever and held out quite a bunch of taffy at the end of a good pole. And so we are here. The boys are marching; they are coming rapidly into the fold—initiation fees free gratis—and they soon discover that this shanty is exclusively devoted to the supply of First-class goods only, made by conscientious workmen—none others need apply—to be distributed, for reasonable value, to the growing and toiling millions of Queen Cow's subjects.

Come and see us at 92 Lake Street, Chicago, and if you cannot come, write early and often; we like it.

Put it there, and give us your ☞

R. LESPINASSE.

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